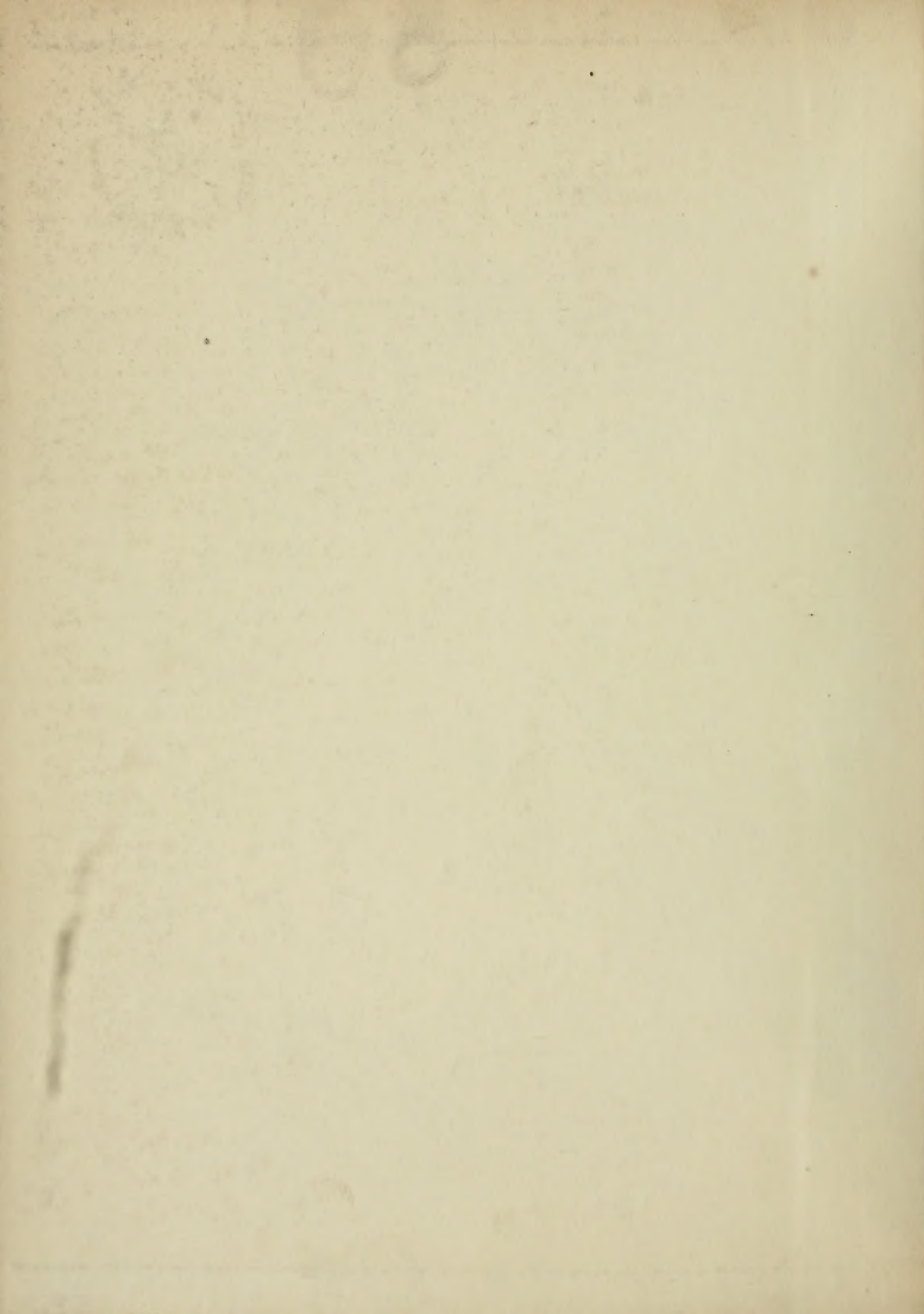




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Pulp and Paper Magazine

OF CANADA

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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VOL. XII.

MONTREAL, JANUARY 1, 1914

No. 1

Our First Year's Expansion

WITH this number, we open the twelfth volume of publication and our second in our present expanded and enlarged form. The PULP AND PAPER MAGAZINE, which was started eleven years ago as a very small journal, went through a slow period of growth during those first years when the pulp and paper industry was only one of Canada's smaller and struggling industries. Now that it is assuming the proportions of one of our largest and most prosperous industries, which uses more of our raw material every year than most others we have shared this growth and have attempted to keep pace with the rapid stride of the industry itself. If we are to believe the many messages which have reached us during this year while we were enlarging and developing, our efforts have met with the greatest success. We must here express our appreciation of the thoughtfulness of subscribers and advertisers in giving these words of encouragement which, in work of this kind, is of the greatest benefit. We know that we are giving to our subscribers for the small sum at which our annual subscription is placed, very much more than journals in other countries devoted to this industry are giving, or in proportion much more than similar magazines in other industries in our own country.

If our subscribers will look over the volume of the back numbers during the last year and realise what a vast amount of information which is really valuable and useful, they have secured, we venture to suggest that they will be surprised at the modest subscription price which is asked.

Looking over the past year, it has been of considerable satisfaction to note such a large number of remarkably good articles. We mention the following few as indications of the type of subjects which have been treated:

"Preservation of Paper."

"Calender Dyeing."

"Manufacture of Sulphite Pulp."

"China Clay."

"Hydrolysis of Cellulose and Ligno-Cellulose."

"United States Forest Products Laboratory."

"Manufacture of Straw Board."

"Testing of Paper."

"Pulp and Paper under the Microscope."

"Tale."

"Hydration in Papermaking Processes."

"Making of Kraft and Sulphite Pulp."

"Chemistry of Rosin Sizing."

"Efficiency Studies."

"Transmission of Power."

"Scientific Forestry."

"Grinding of Spruce for Mechanical Pulp."

"Conversion of Long Leaf Pine to Paper Pulp."

"Power Consumption when Beating Half or Whole Stuffs."

"Large or small Beating Engines."

"Micro Photographs of Papermaking Woods."

For the coming year, we propose to extend this expansion and enlarge our outlook in a very material manner.

For the past we thank all our friends and clients and for the future we promise the very best which the world of pulp and paper affords.

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American Wood Pulp Refunds

THE decision of the American Congress to refund the Wood Pulp Importers of duties paid illegally since the Canadian Reciprocity Act came into effect on July 26th, 1911, has not been carried out as it was first reported it would be. It seems that the Treasury Department is attempting to hold back by hook or by crook, as much of this \$3,000,000 as possible. Each individual case must be taken before court and go through the general round of expensive litigation. Commenting on this situation, Mr. Albert H. Washburn of Conistock and attorney for the American Wood Pulp Importers' Association says:

"When the Government issued its letter of acquiescence last summer (conformably to its usual practice), I think we all assumed, quite naturally, that the end of this litigation was assured. It developed subsequently that the refunds being made were limited to those protests actually in the possession of the various Collectors of Customs—in other words, protests which had not been forwarded to the Board of General Appraisers for action under the statute. As they go forward in a routine manner, it happened that the refunds affected only, generally speaking, the latest shipments. All the other protests were on the suspended files of the Board of General Appraisers awaiting the final outcome.

When my office sought to have these thousands of cases taken up for prompt decision we encountered opposition. Except by consent they could only be disposed of by regular calendar call on the Board docket and that consent was withheld. This meant delay until the "autumn. By that time it was evident enough to me that a matter of policy was involved here, and what that policy was presently became plain enough in view of the disquieting rumors of special legislation to enable the Supreme Court to review the decision of the Court of Customs Appeals. That this is the programme is no longer concealed. Whether it will succeed or not remains to be seen. With the tremendous weight and influence of the Administration, as reflected by the Attorney-General and the Treasury Department, there is certainly ground for apprehension. If it does succeed the ultimate outcome will be prolonged for months, and perhaps years.

The number of protests is so large and the work of examining the affidavits and invoices in each case such that the clerical labor of disposition is enormous. Without going into detail, it is sufficient to say that it would take several months to bring this matter to the point where the collectors could reliquidate and refund even if the Government were to co-operate with us to secure reasonable expedition. In the absence of that co-operation, it is entirely possible (by the simple device of appealing at the end of the statutory time allowed) for the

Government to delay action for a number of months. By then legislation either will or will not have been secured, and my best judgment is based on a number of conferences with various officials, that, if the legislation be not obtained within a reasonable time, the Government will quit and consent to expedition and final settlement.

"This is a plain statement of the present situation. Whether Congress will approve of the Government programme is not yet apparent. It amounts, of course, virtually to an effort to recall an acquiescence in and reverse, if possible, the decision of the Court of Customs Appeals. It may be that some of your customers, who are, I believe, largely interested under their contracts with the members of your association in these refunds may wish to take up this matter with the members of Congress and Senators from their respective States and enter a vigorous protest against this proposed legislation. Action has been deferred, I understand, until the opening of the regular session is most opportune. It seems unfair to ask that this legislation apply to issues decided in the case and thus make it virtually retroactive. If it is to be enacted at all, it should operate prospectively only, that is to say, to cases arising under the law of 1913."

The decisions of the Treasury Department of the United States have been most vacillating in this connection. Under the Favored Nations Treaty, they found they were obliged to give the same treatment to all countries as to Canada. Great objection has, however, come up to the way in which the matter has been handled by the Department. It has been difficult for the Wood Pulp Importers to know where they are at. Such conditions make trade most unsatisfactory and it seems that in the pulp and paper industry, the Treasury Department has a special faculty for making very peculiar decisions.

An Opportunity for a Pulp and Paper Technical School in Canada

THE recent reports since the opening of the University of Maine have advised us that they are establishing there a department of pulp and paper making similar to the school which is in operation at Darmstadt, Germany. This will fill a long felt need in the United States where, as Mr. Hastings, President of the American Paper and Pulp Makers Association, says: "What the paper manufacturers want is a better class of men to become interested in the manufacture of paper. . . . The Association now has on file the requests of many manufacturers for superintendents and managers of paper mills, and it is very difficult to secure men with necessary practical knowledge to

take up the positions. The salaries are unusually good for the amount of ability required, but there do not seem to be enough men to go around."

The University of Maine is erecting a \$75,000 building which will accommodate this course in pulp and paper. As is well-known to our readers, there is a very fine technical school in Manchester, England, which gives courses on pulp and paper manufacturing. The number of students there, however, taking this course is only about ten to fifteen, so we naturally see the case of a country like Great Britain, which is a large manufacturer of pulp and paper, only supplying a few students to such a school. It is quite certain that there is not an opportunity in this country for a separate school on pulp and paper technology, but as we have pointed out before, a combination of circumstances is making such an opportunity in Montreal where any who are looking for such chances, no matter how few, may find them. McGill University is giving more attention than probably any other university on the continent to pulp and paper work. Besides this, the Government is establishing in Montreal, on the McGill Grounds, the new New Forest Products Laboratories. These, coupled with the advantages of a technical school of Montreal, make a chance here for short or long courses for those interested in pulp and paper. By next year any young man who wants to spend a couple of months in this kind of work will be able to do so in Montreal. This is exactly what we need for we are suffering very much from a lack of technical help in this country.

Editorial Comments

It is reported that the Dominion Government will not fill the vacant positions of trade commissioners in the various foreign ports, but will avail themselves of Great Britain's offer to make use of British consular service. This, on the face of it, looks like a good proposition, but is really a retrograde step in our commercial expansion. The development of Canadian trade in foreign ports should be left to Canadians, who are far more competent to promote our interests than British Consuls, who, although they would unquestionably render honest service, have not the knowledge and experience to render efficient service for this country. We are taking our place in the world's markets and are just now at a critical stage where it would be the grossest kind of foolish economy to save a few salaries in trade commissioners. Besides this, Canadians should have the opportunity of seeing in a representative capacity, something of the rest of the world. They would come back and be much greater factors in our commercial life. We sincerely hope that the Federal Government

will not attempt this experiment fraught with mischief making possibilities.

* * * *

The article in this issue on "Power: Its use in the Manufacture of Ground Wood," by J. H. Thickers, Ch.E., is most timely and useful. Mr. Thickers is without doubt the best qualified man in the world to speak on matters relating to the manufacture of ground wood. He is not only a technical man, but a practical pulp and paper manufacturer as well. We commend this article to the serious consideration of all interested in Ground Wood Manufacture.

BOARD FOR PACKING JOINTS.

Whereas packing made of rubber, textile fabrics, asbestos, etc., is used for high-pressure pipes, for low-pressure pipes packing made of board specially manufactured for the purpose is being used more and more. A very good board of this kind is made from pure soda cellulose. For cheap kinds up to 40% old paper is added, as strong old paper as possible being used. As to rags, only the cheap kinds of linen, cotton or jute rags are used. These are boiled with a little caustic soda at 2 to 2½ atmos. pressure and are charged unbleached into the beater.

The pulp must be beaten fairly greasy in the beater and is sized therein, preferably with animal size. If rosin size is employed this must be such that when the board is subsequently dried in the air (flue drying) it is sufficiently sized. Packing board is generally colored like red or grey rubber, and for this purpose is dyed as fast as possible with aniline dyes. Loading materials should be as free as possible from sand because otherwise the stamping blades suffer very much. One must work in such manner on the cylinder machine that the board is composed of as thin layers as possible and that they adhere firmly one to another. After being removed from the size-roll the board is hydraulically pressed, the press being filled as high as possible. The boards pass from the hydraulic press into the drying flue. Very thick boards which can not be suspended are sent through the drying flue whilst lying horizontally on specially constructed trucks. The flue must be so arranged that the boards are moistened at the end by air, so that they are obtained as tough as leather.

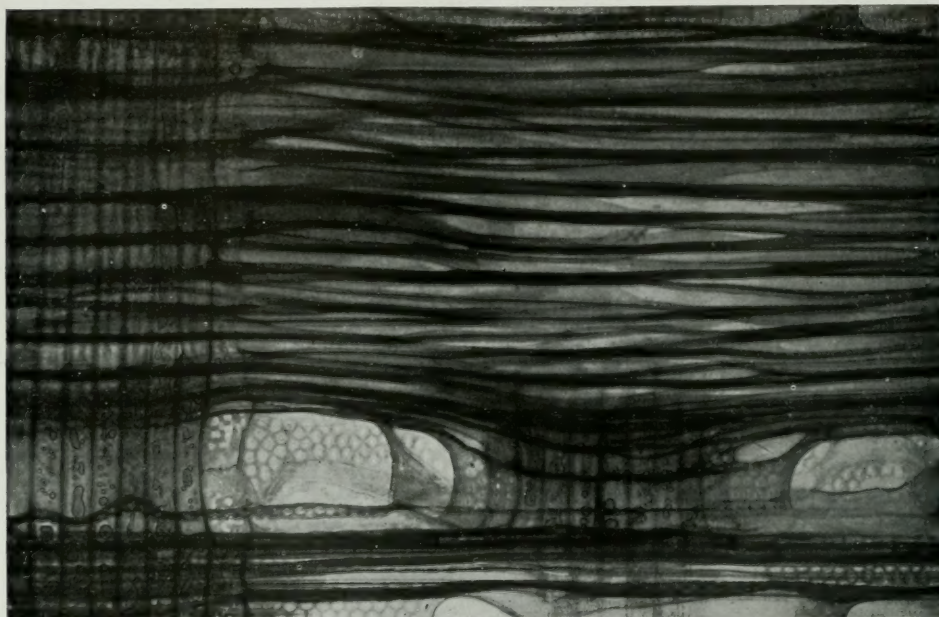
By admixing long cocoa-nut fibres packing board can be made which is very firm, even when otherwise only old paper is employed. The cocoa-nut fibres are added to the beater shortly before it is emptied. Generally it is necessary to wash the cocoa-nut fibres beforehand in the washing-engine. The pulp is not sent through the strainer because the cocoa-nut fibres would be retained. In the hydraulic press, press-cloths must be laid between the individual boards because the cocoa-nut fibres otherwise press into the next board.

These boards are not calendered; they are only repeatedly turned over and protected from becoming wavy by loading them severely.

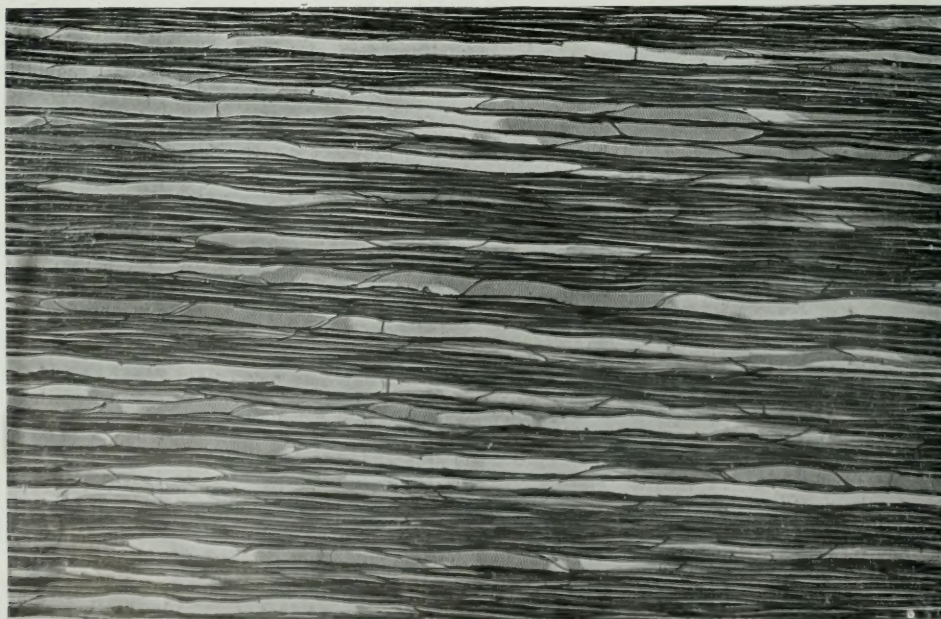
Micro. Photographs of Paper Making Woods---POPLAR

By H. D. TIEMANS, U.S. Forest Products Laboratory, Madison, Wis.

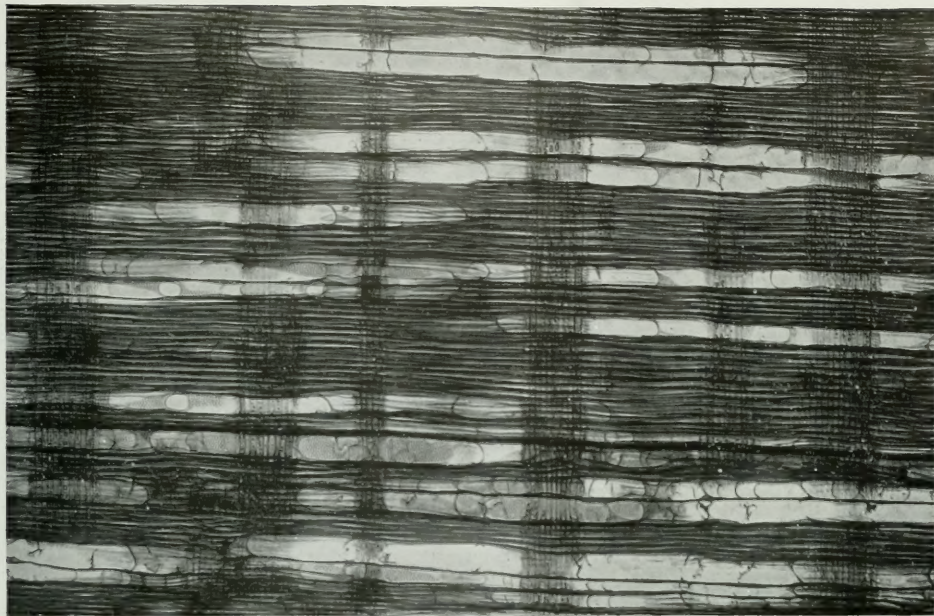
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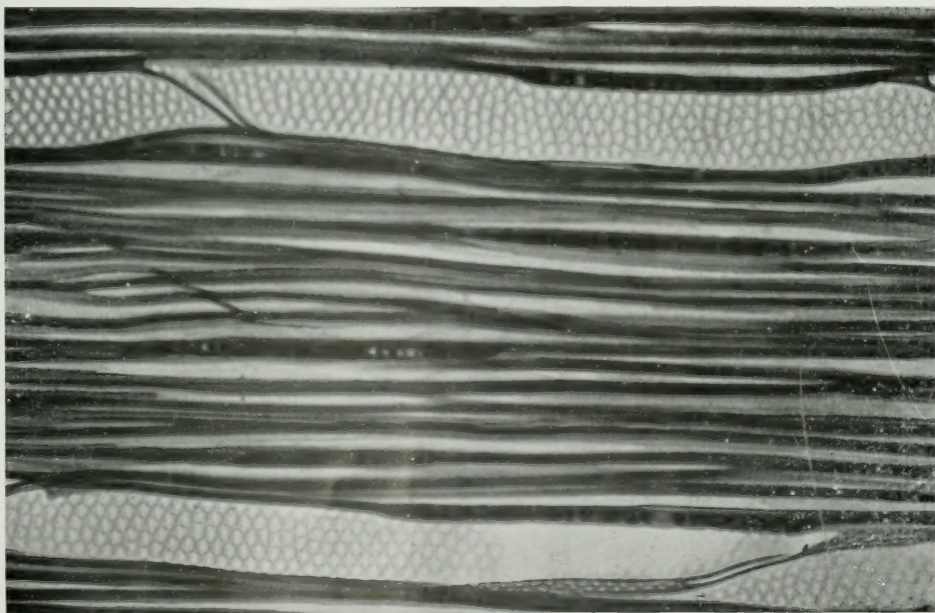
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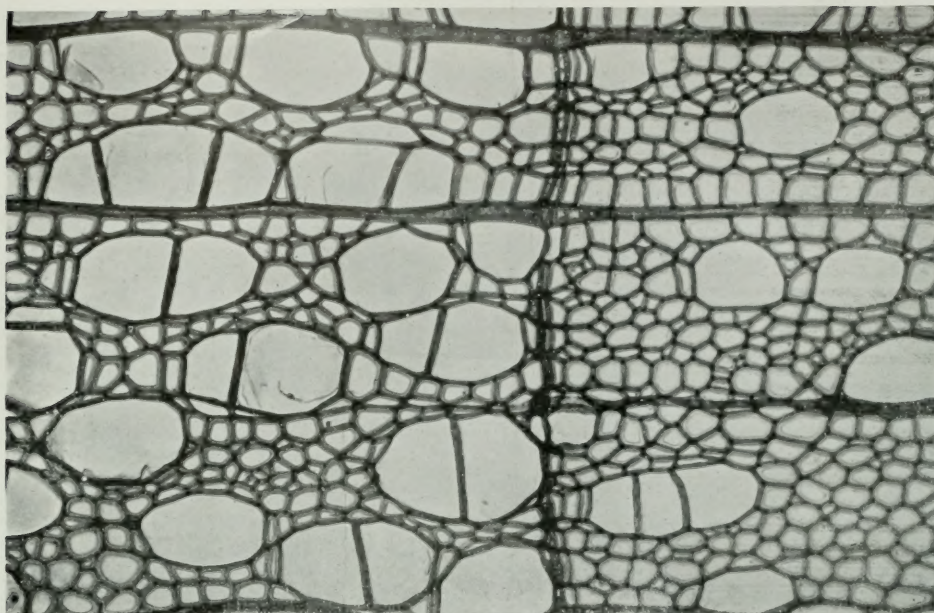
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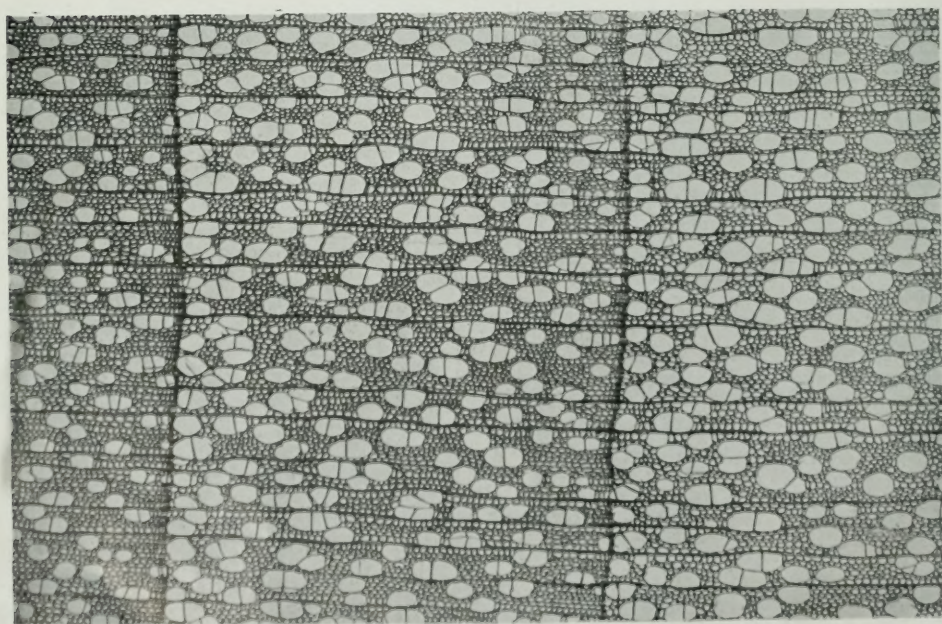
POPULUS TREMULOIDES—Aspen—Poplar. Radial X 50



POPULUS TREMULOIDES—Aspen—Poplar. Tangential X 250



POPULUS TREMULOIDES—Aspen—Poplar. Transverse X 250



POPULUS TREMULOIDES—Aspen—Poplar. Transverse X 50.

POWER

Its Use in the Manufacture of Ground Wood

By J. H. THICKENS, Ch. E.



THE disintegration of wood to produce mechanical pulp is one of those processes which rely almost entirely upon the employment of main force for their accomplishment. Numerous attempts have been made to bring about the same result with the use of less power but so far these efforts have not entirely been successful. Wood is still held by pressure against a revolving pulp stone to produce practically fifty per cent. of the wood fibre used by pulp, paper and board manufacturers; a total of two million cords of wood are reduced to pulp in this manner each year.

When the amount of power which is required to carry out this disintegration is considered, the question of its more efficient utilization is immediately seen to be of prime importance. In the United States approximately 500,000 horsepower are used continuously in grinding of wood for mechanical pulp and it is quite evident that the possible adoption of more efficient methods would only result in a considerable saving of power and money each year.

In the past the designing of ground wood mills has been largely influenced by the manufacturers in the immediate vicinity of the mills under construction. Certain rules of thumb and unsupported theories have in many cases taken the place of correct scientific knowledge of the effect of the utilization of power under different conditions in the grinding operation. This is clearly shown when the methods of production of pulp in the different mills are considered.

There are in the United States approximately fifteen hundred wood pulp grinders of different size under operation and each one of these utilizes on the average approximately 350 horsepower continuously. Many of the grinders, however, are driven by as little as 135 horsepower and in other instances as much as 800 horsepower is available on pulp stones of like size. The great variation in the amount of power consumed is more striking when it is considered that the pulp is used most frequently in the production of the same kinds of paper, news print paper for the most part. It is evident that the consumption of such widely differing amounts of power on the stone must be accompanied by correspondingly great differences in the pressure, speed and surface of stone used in the manufacture of pulp. When so many different operating conditions are employed, it is likely that a large number are inefficient and a measure which could be taken to bring about a standardization of practice would necessarily result in more economical production.

As the result of experiments carried on by the United States Forest Service at Wausau, Wisconsin, it was found that there are a number of definite relations which exist between the speed of the pulp stone, pressure employed, surface of the stone, quality and rate of production of pulp and the power consumed in its manufacture. All these factors must consequently be considered in the selection of the grinding conditions.

Briefly, the results secured indicate that:

1. The rate of production varies directly with the pressure speed and the degree of sharpness of the stone.

2. The horsepower consumption per ton increases as the pressure decreases according to a fairly definite mathematical law. It is lower on sharp stones than on dull ones and increases as the speed decreases in much the same manner as it does with the pressure.

3. The yield of pulp per cord of wood increases with the pressure but it is not greatly influenced by the surface of the stone. The yield is slightly higher with high speed operation than with low.

4. The quality varies greatly with the surface of the stone and also with the pressure but is not largely influenced by the peripheral speed. A better quality is secured at high pressure and low speed than at high speed and low pressure.

Further consideration of these relations gives rise to interesting situations which show the possibilities of saving power and utilizing it more efficiently.

Considering the grinding pressure, it has been noted that the yield can be increased as much as 11% and the production increased 40% to 50% without making any other changes than the elimination of pockets on some of the grinders or of an entire grinder when there are a number of them on a single shaft. Take for example two three-pocket grinders with stone 54 inches in diameter by 27 inches face on a single shaft operating at 225 R.P.M. with one pocket as a surplus and having applied on each of the grinders 275 horsepower. With a fairly dull surface on the pulp stone it would be necessary to use a pressure of 40 pounds per square inch on two 14-inch cylinders of each of the grinders to consume this power and above three tons of pulp would be produced from each one or a total of six tons. If one of the grinders were eliminated and all of the power, 550 horsepower, were applied to a single stone and utilized in two pockets at the peripheral speed, a pressure of 100 pounds per square inch would be required on each of the two 14-inch cylinders to consume the power and the production of pulp would be increased to ten tons in 24 hours, an increase of four tons in the same period of time over that obtained from the two stones; in other words, doubling the power to a single grinder would treble its output in 24 hours.

In the example cited the power consumption per ton, if two grinders were used, would be approximately 92 horsepower while if only one were employed, it would be 55 horsepower. This reduction in power consumption per ton would be of course accompanied by the reduction in the quality of the product but not a corresponding reduction.

If the total of 550 horsepower were applied to a single pulp stone just as was done when a result of power consumption of 55 horsepower was secured and the stone were run considerably duller, the total consumption per ton could be brought up in the neighborhood of 80 to 90 horsepower and the

pulp could be obtained which would be considerably better than that produced with the like power consumption on two grinders. This would be brought about due to the fact that the quality of the pulp produced is much more greatly influenced by the differences in the surfaces of the stone than by the pressure employed.

Stronger pulp can be produced per horsepower at low values of power consumption than at high. Newspaper made experimentally for example, of a combination of 20% sulphite and 80% ground wood has a breaking length of 55 meters per horsepower per ton used in making the pulp if the latter is 55 horsepower per ton. The breaking length decreases to 45 meters per horsepower per ton if the paper is made of 20% of sulphite and 80% of ground wood produced at a power consumption of 92 horsepower per ton.

Here one immediately notes that the cost of the sulphite necessary to make up the difference in the strength is a factor equally as important as the power. In the example given above, the news print paper containing pulp produced at 55 horsepower per ton tested by Mullen tester had a strength factor of 0.300 points per pound, while that which contained pulp made at 92 horsepower per ton had a strength factor of .460. The tests given are high because of the fact that the papers were made at slow speed and were better formed and dried more slowly than could be done commercially.

In commercial practice the relative test would be more nearly .23 or .35 points per pound respectively for the pulps made with low and high power consumption. This difference in strength would have to be made up by the addition of sulphite to the weaker pulp and it would be necessary to determine in order to see that this is economical, that the saving on approximately 888 horsepower hours and the resultant gain in production would counterbalance the greater amount of sulphite needed. When the grinding pressure is raised a considerable saving is made by virtue of the fact that the yield per cord of wood is increased and this must also be held in mind in determining the most efficient power consumption per ton to use.

With a definite amount of power applied to the grinder, increasing the grinding pressure would have to be accompanied by reduction in speed or the use of a lesser number of pockets on the grinder. The efficiency of the turbine in case of waterwheel drive depends on being fixed at a certain speed likewise with motor drives the speed is fixed. So, if the pressure is to be increased, it is best to use fewer pockets on the grinders and the use of a smaller number of pockets is accompanied by another saving and results in increased efficiency. When all of the cells on a three cell grinder are used due to the landing of the wood in the cells and the need of filling them, the total power available is only utilized about 88% to 90% of the time. In other words 88% to 90% of the power is not utilized. If the pressure is raised on all three of the grinder cylinders and only two pockets are used in the operation, the third one being employed as a reservoir to be put on before another is thrown off, the total power will be utilized from 90% to 95% of the time. This means a great saving of power applied to a large number of grinders and it can be made still greater by employing a four-pocket grinder and using three pockets in the manufacture of the pulp.

The amount of power applied to grinders has been increasing from year to year. Installations made as early as 1880 are still in operation with approximately 125 horsepower to a stone, but the later designed mills seldom contain grinders to which less than 500 horsepower is applied. At the present time installations are being made where the grinders will operate under loads of from 600 to 800 horsepower and there are some employing grinders of different design where 1,200 horsepower are utilized on a single stone. Using accurate data, upon one-half of the grinders in the United States as the basis of an estimate, 36% of the total number of grinders employed are driven by turbines and motors of less than 300 horsepower capacity, and 8% of the grinders are driven with less than 200 horsepower. A more economical operation from the labor standpoint, greater yield, lower power consumption, higher rate of product, lower pulp stone cost would be obtained by more than one third of the producers of mechanical pulp if they would alter their equipment so as to use their power on approximately one-half of the number of stones. The production of as large an amount as possible from a single unit has been and always will be the motto followed by the progressive manufacturer. Generally, this is on the basis of the labor saving. In the case of wood-grinding, however, there is an added inducement on account of the more efficient production of pulp by the grinders as a consequence of the characteristics of the grinding process and the power saving which is effected results in greater production and that means an added measure of profit.

As long as spruce is available for the production of ground wood, it will not be necessary to use great care in the selection of the grinding conditions if the influence of these factors only on the quality of the product is considered. However, a fairly dull stone, high pressure and high speed or in other words, a large amount of power to a grinder will assure the manufacturer of product which will meet practically all requirements, and at the same time assure a more economical base of operation.

There are many conditions which require a very careful grinding of the raw material. One of these is encountered when the product is to be used in the production of a paper where chemical pulp is of relatively greater value than the power employed in the manufacture of ground wood. It is the general practice of news print manufacturers to use from 20% to 30% sulphite in their product. This amount can be very easily reduced to from 10% to 15% and a paper of equal strength made if more power is used in the grinding of the wood. It is possible to produce news print paper of required strength and much better finish and appearance and not use any sulphite in its manufacture, but this is a condition which necessitates more than the usual care in the production of the ground wood pulp.

It is the contention of one group of papermakers that especially news print is made on the pulp stone while another group is of the opinion that the place to make it is in the beaters. It seems more logical to make the pulp on the grinders than it does in the beaters, particularly under the present method of operations. With the advent of stone roll beaters and the use of beaters designed

to give greater efficiency, it is not unlikely that at some time-in the future, pulp will be ground coarsely on the stones with the consumption of a small amount of power per ton and this material will be brushed under stone roll beaters with the resultant use of less power than is used at the present time, but before such a condition can exist, it would be necessary to prevent the formation of so much fine material in the grinding process. After the fibre has been cut into small portions, it is no longer possible to draw it out materially.

In each mill where mechanical pulp is produced, the subject of efficient utilization of grinding power is one which requires undivided attention to conditions governing the production of the pulp and its utilization is never the same in any two cases. It may be more economical to produce pulp at 50 horsepower and get double the production or use 100 horsepower per ton and greatly reduce the quantity of strength-giving fibre necessary to make a sheet of the required physical properties. Many producers would be inclined to change their operating conditions if they would give this matter careful thought. How frequently is it the case that power is being used by producers of mechanical pulp which could be sold as electrical energy at from \$20 to \$30 per horsepower year and they are not making a charge for it in the calculation of the cost of production? When 75 horsepower are used in making a ton of pulp in twenty-four hours, the charge for power at \$25 per horsepower year would be approximately \$6.25. What manufacturer could stand a charge like this?

The Manufacture of a Product Resembling Vulcanized Fibre

As raw materials cotton and linen are exclusively employed. The rags are very carefully sorted and before pulping are well boiled with soda. Beating is then carried out in the beating engine until no remnant of the fabric is longer present; the fibres must in this case remain unshortened. The pulp is caused to run direct from the beater into a centrifugal machine, the drum of which is lined with metallic cloth; the soda solution is thus flung out and the fragments of the fibres which are liable to cause trouble later on in the process are removed these fragments after separation being collected. The washed pulp is thereupon mixed with a quantity of zinc chloride and is converted by hand or on machines into a loose or spongy pulp sheet.

The chemical treatment of the pulp sheet so obtained has for its object to swell the various fibres and to convert them into a colloidal condition. According to the desired quality, the fibre may be converted into this condition only at the surface of the sheet. Of various solvents the greatest advantages are derived from zinc chloride because it is inodorous and 90% can be recovered. On the sheet which is then placed in a stoneware pan, is thereupon poured a zinc chloride solution of about 60° Be and the pan is then covered with

a glass plate. After some hours the excess lye is drained off and the sheet which appears viscous on its surface is uniformly strewn with a layer several millimeters thick of finely sifted zinc chloride. When the powder has dissolved, the process can be accelerated by slight but very uniform heating. Regulation of the heat is best obtained in an electrically heated muffle furnace. The front wall of the furnace consists of a thick glass plate and the progress of the process can be followed by the aid of an incandescent lamp mounted in the interior of the furnace as also by means of several thermometers arranged at the furnace. At the beginning the temperature should amount at most to 40°, thereupon the temperature is allowed to rise during one hour to 60-70°. The surface of the mass gradually becomes vitreous and the unevennesses disappear, whereupon the pan is carefully removed from the furnace and covered with a glass plate until cool. After removal of the glass plate the zinc chloride absorbs water from the air, the lye is poured off, and the pan is filled with water and allowed to stand for some hours. The sheet is then carefully removed from the pan, laid on the glass plate and set up over larger pans so that the solution can drain off. The sheet is thereupon watered while lying on lead coated wire netting and is dried with the gradual application of heat, and if necessary in vacuo. The sheet which is slightly wavy is then while cold pressed out flat by application of strong pressure. In this way is obtained a material which is pale yellow in colour, is fairly transparent in its centimeter, and is not softened by heat but on the other hand always becomes harder. It is quite as elastic as a solid hard rubber, its breaking stress is considerably higher and it is a perfect substitute for vulcanized fibre. The further treatment of this material is the same as in the case of natural horn.

The fine fibres separated by centrifugal action are treated with a weak soda solution, pressed through a small filterpress, washed and dried, and after being ground in the edge runners serve as an admixture for hard rubber, the qualities of which are thereby much improved.

The zinc chloride must of course be regenerated as then only is a rational manufacture possible.

NEW PAPER MILLS IN NORWAY.

The ground wood pulp mill company, Ankers Trasliperi in Skaaningsfos, near Frederikshald, has commenced to erect a paper mill, and the Saugbrugsforeningen (Saw Mill Association) will soon begin construction of a paper mill, decided some time ago, at Porsnaes, on the same river, the Tista River. An electric power central will be built at the Tistafos waterfall.

The new sulphite mill in Obbola, North Sweden, has lately been started. It is the most northern sulphate mill in Europe and was built for a yearly production of 12,000 tons, but to begin with only 10,000 tons will be manufactured.

The Kotka Cellulose Mill, Kotka, Finland, which was destroyed by fire some time ago, will be rebuilt and the manufacture of sulphite pulp continued.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

William Price, President Price Bros. & Co., Quebec

(A series of monthly articles in the Pulp and Paper Magazine.)

By W. A. CRAICK



IN THE case of a large majority of Canada's captains of industry it has been the story of a climb from some humble position to the top of the ladder. As yet there have been few instances where a man has inherited the control of great enterprises. What with the tendency to form corporations and amalgamations, the son of the founder of any large industry is like as not to find himself side-tracked in the management, a result that is often as not of distinct advantage to the business, if not to the young man himself.

William Price belongs to the exceptional class. He inherited not only the management but the

circumspectly or there might have been some danger of the property being devised to others.

Apart from the fact that he was a nephew and not a son, there is another rather curious feature about William Price and that is that he was born in Chile, the place of his birth being the town of Palca. His father, Henry Price, who was one of the younger sons of old William Price, had been as a young man of a roving and adventurous disposition. He had first of all learned the trade of ship's carpenter in the Gilmour shipyard, located at Wolfe's Cove just below the Price homestead, and having done so, soon after set off for South America. There he landed in Chile and for several years led a vicarious existence in that southern republic, amassing a moderate fortune in the interval. Later on he returned to Canada and took up farming in Ontario, moving eventually to Toronto where he died in 1899.

William Price was sent for his education to England and there he attended St. Mark's School at Windsor. When his parents returned to Canada, he was brought home and placed at Bishop's College School at Lennoxville, where he completed his training. In the meantime his three bachelor uncles, David, William and John, the original Price Brothers, had been building up an immense trade in lumber on the Saguenay and Lower St. Lawrence. All three had become notable figures in the country, David and John being successively Dominion senators and William a member of the Quebec Legislature. Following the death of William in 1880 and of David in 1883, John had become the sole partner. He looked about for some one to succeed him in the control of the business and selected his eldest nephew for the purpose.

When nineteen years of age, William Price entered his uncle's office in Quebec and for thirteen years was in training to assume the duties which John Price laid down on his death in 1899. During this time he filled various offices and absorbed all that was to be learned about the business. If his uncle had any doubts about his ability to handle the property, they were soon set at rest, for he exhibited great energy and resourcefulness and was above all most reliable, a quality which has always been in evidence among the Prices.

It is now fifteen years since the immense property of the Price Brothers passed into the hands of their nephew. In the interval much has been done to enlarge the scope of the business and to develop its latent resources. To William Price must be given credit for having branched out into the pulp and paper industry. Before his time the entire energies of the firm had been directed towards lumbering, but he soon saw the advantage of getting into the other line. With Mr. Porritt, a practical man, he started the Price-Porritt Pulp Co. at Rimouski about twelve years ago. Later



WILLIAM PRICE

actual possession of a great industrial estate when he was thirty-two years of age. What is more, he represented the third generation in control. Usually by this time a third generation presents itself some measure of degeneration from the ability of the founder may be expected but it was not so with the young Quebecer. He gave evidence of having even superior talents to those possessed by the man who preceded him.

One secret of William Price's notable success may be traced to the circumstance that he was not the direct inheritor of the enterprises which the grandfather had established. Had he been aware from his youth up that he would at right time come in for the great estate which his uncles, the Price Brothers, had accumulated after the old man's death, certain undesirable influences might have made their appearance in him. As it was he grew up in a position in which he had to talk

he acquired the Jonquiere Pulp Co. near Chicoutimi. These were run independently until 1910 when on a reorganization of the Price Bros. Company, they were absorbed in the larger corporations. Recently by the erection of the fine large Kenogami Paper Mills on the Au Sable River, in which Mr. Price has taken a great personal interest, the Jonquiere Pulp Co. has been very much enlarged and its output considerably increased.

While William Price transferred his personal interests to the incorporated company of Price Bros. & Co., in 1904, becoming its president, he still holds a large majority of the common stock and a good slice of the bond issue. He remains the dominating force in all the Company's activities and this means a great deal where so much is involved. The Price Company to-day controls 6,400 square miles of timber limits, besides owning outright the lands of five seigneuries amounting to 300 square miles. It operates twelve saw and shingle mills, having an annual output of one hundred million feet board measure per annum. It gives employment to 4,800 men. Its limits are estimated to contain three thousand million feet of merchantable timber and twenty million cords of pulp wood.

Monarch of all these resources, William Price is a figure to be reckoned with in the industrial life of the country. He is now in the prime of life, a man of stout build and great vitality. He leads a very busy existence, keeping hand and eye constantly on all parts of the big machine. This involves a great deal of travelling about and he is probably away from his fine house on the Grand Allée in Quebec more than he is at home. He is not quite a slave to work, however, for he can always spare time for a romp with his children of whom he is very fond.

Neither is he a man solely intent on money-making and the advancement of his own personal interests. He has shown himself to be public-spirited and to-day, as chairman of the Quebec Harbor Commission, he is doing excellent work in building up the port. As an ex-president of the Board of Trade, an ex-governor of the Jeffrey Hale Hospital and a supporter of various philanthropical organizations, he has always done his share of good works. Old employees of the Price firm realize something of his generosity, for it is known that he is paying the pensions of several of them out of his own pocket.

In 1904 Mr. Price contested Rimouski in the conservative interest but was defeated. He ran for Quebec West in 1908 and won. He sat at Ottawa until 1911 when he tested his constituency again but without success. The victory of Mr. Borden, however, meant that his defeat was not without compensation, for he became all-powerful in Quebec as the local conservative leader. He has used his opportunities well and has been able to do a great deal for the development of his city.

Beyond the demands of his own business and the interests already mentioned, Mr. Price is connected with several other financial and industrial concerns. He succeeded his uncle on the directorate of the Union Bank and later became its vice-president. He is now honorary president of the Bank having succeeded the late Hon. John Sharples in the position.

As a young man Mr. Price was quite expert as a football player and could also pull a good oar. Nowadays he takes respite from his work in fishing,

a sport which he is able to enjoy under the most favorable conditions. He also does some shooting in the season. He owns several hunting and fishing lodges at various points on his property and is always quite generous in allowing his friends to make use of them.

If one were to seek the principal characteristics of Mr. Price, it would be to find that his honesty and integrity were most in evidence. He has no use for the tricky man and, when once he has been deceived by anyone, he is relentless in his condemnation. From others he always expects to receive the same kind of treatment that he metes out to them. He is quite outspoken in his opinions, says exactly what he thinks and can at times be decidedly abrupt. But at heart he is solid and is a good friend to those who deal squarely with him.

DISTINGUISHING PULPS IN PAPER.

SCHWALBE's method of distinguishing sulphite and sulphate pulp in paper is concisely stated as follows: The paper is finely divided by a rasp or grater and freed from resin by extraction with alcohol and ether. In the case of very hard soda pulp papers which yield much dust on rasping, the paper may be extracted with alcohol and ether and finely divided by boiling for $\frac{1}{4}$ hour with water and then shaking with glass beads.

The dried pulp is treated with one-twentieth normal ferric chloride solution and heated at 60 degrees to 80 degrees C. until the pulp settles to the bottom of the vessel.

After carefully removing and rejecting any pulp adhering to the sides of the vessel, the mixture is filtered and the pulp washed with warm water, and treated first with 1 per cent. sulphuric acid and then 4 to 8 drops of a 2 per cent. solution of potassium ferrocyanide and heated for 5 to 10 minutes at 60 degrees to 80 degrees C. The treatment with sulphuric acid and ferrocyanide may be repeated, if necessary, in order to develop a more pronounced blue color.

The pulp is now separated (any adhering to the sides of the vessel being carefully removed and rejected as before), washed, and examined under the microscope. The fibres of sulphite pulp are colored deep blue, whilst those of unbleached sulphate pulp acquire a faint yellowish, greenish or brownish color, and those of bleached sulphate pulp either remain uncolored or are colored a faint blue. The relative proportions by counting the differently colored fibres.

H. M. Jones general manager of the Edward Partington Pulp and Paper Co., St. John, N. B., was in Toronto and other eastern points last week on a business trip.

The Howel Co. of Toronto, have been appointed selling agents for Ontario and the East of the pulp. The plant of the company is closed down at present owing to the rebuilding of an evaporator but it is expected that operations will be commenced again about the end of January. The output of pure kraft pulp will be forty tons per day. All the pulp is put through stone beater rolls in place of the kollergangs and some fine specimens are being shown.

THE KOLLERGANG

By LEO. SCHLICK, M.E.



THE origin of the kollergang dates back to remote ages. In China it has been in use for centuries to grind grain and rice.

Before the twelfth century, Kollergangs were used by the Arabs and Italians, who recognized the disintegrating effect of stone discs forced to rotate round a fixed point and running on a horizontal stone plate. Thus by the kollergang—also called edge runner mill—has been introduced in many centuries.

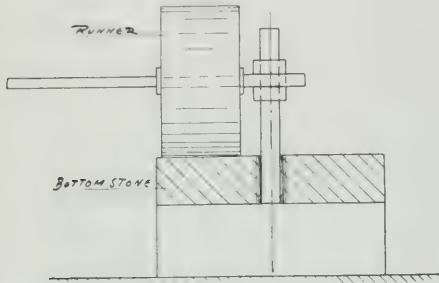


FIG 1

Fig. 1. Chinese Kollergang with One Stone.

Around 1870 or so the Scientist, Ernst Kirchner of Saxony—in those days paper mill manager—recommended the use of kollergangs for the repulping of waste paper and for the pulping of lime treated straw pulp and the like. Mr. Kirchner went ahead and designed the "Kirchner's frame Kollergang," and introduced this machine in paper mills, the results being excellent. During the past thirty years their fame has been spread over the world. We find them in Canada giving the final touch to kraft pulp, pulping knots of sulphite mills, in the United States of America, repulping old papers and broke (Wisconsin District), also in England, Germany and Scandinavia.

The Kollergang is composed off he following: Two vertical stone discs (runners), L-L are forced to revolve round a vertical shaft W, and are running on bottomstone B. The runners are provided with cast iron bushings and revolve on journals. The end thrust of the runners is taken by a collar, being connected to the journal. The bottom stone B forms the bottom of a pan, which sides are of cast iron or wrought iron. As the material fed into the pan is to be reduced between the runner and bottom stone, the latter have to be movable up and down. This is done by means of cranks in modern types or by means of a steel frame acting as a crank. Cranks or steel frames swing on a pivot pin or on means of steel bolts. The drive is effected by means of a pair of bevel gears and a countershaft.

The different letters in figures 2 and 3—a reproduction of an original drawing of Mr. Kirchner—indicate the following: L and L2 are the runners, same are placed differently from the center-shaft

V is to be the driving shaft; U the bevel gears; W the vertical shaft. W is held in position by means of bearing C and A. A small scraper S prevents the falling of pulp into the bearing B. S3 is another scraper, which scrapes the material underneath the runners. The cross Q is connected to the vertical shaft W and bears two steel rods C3 and C2 (Figure 3), on which frames M are swinging. Figure 4 shows a modern kollergang. The stone runners are held by means of cranks, the latter being connected to a cross frame of cast

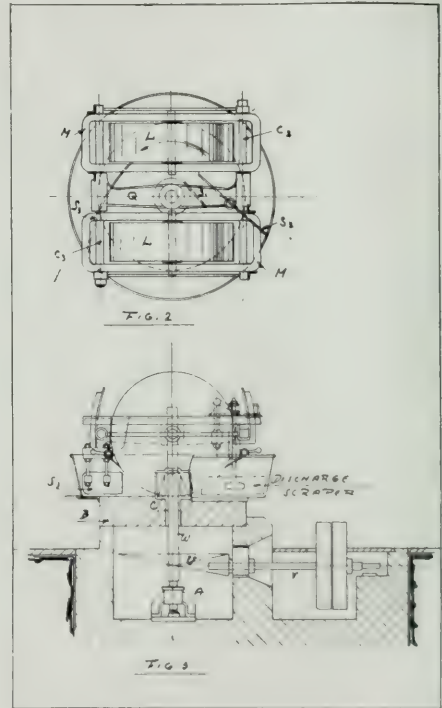


Fig. 2. Kollergang System Ernst Kirchner.

iron. The drive is effected by means of a vertical shaft and bevel gears.

As stated above the material to be repulped or disintegrated is turned, mixed and scraped underneath the runners by means of steel scraper, same doing this work automatically.

In order to simplify the machine, these scrapers have been eliminated by shaping the pan as per Figure No. 5. The outer edges of the revolving stones turn and mix the material, and same is pushed underneath the runners by the runners themselves. This arrangement is very satisfactory and of great advantage where soft papers or already disintegrated pulp, etc., are to be treated. For playing cards and hard waste, however, the scrapers

should be preferred as the pans can be designed less high, thus allowing to take out lumps of paper when required.

The disintegrating process is as follows and as per diagram figures 6, 7, and 8.

The runners rest their full weight on the material to be treated. Runners in figures 6 have the in-

in old papers or broke is up to 12 tons per 24 hours.

The way of treating papers is as follows. Put the machine into operation, fill the pan with waste paper and moisten them to a certain degree direct in the pan by means of cold water. The pan will be sufficiently filled within 10 to 20 minutes and

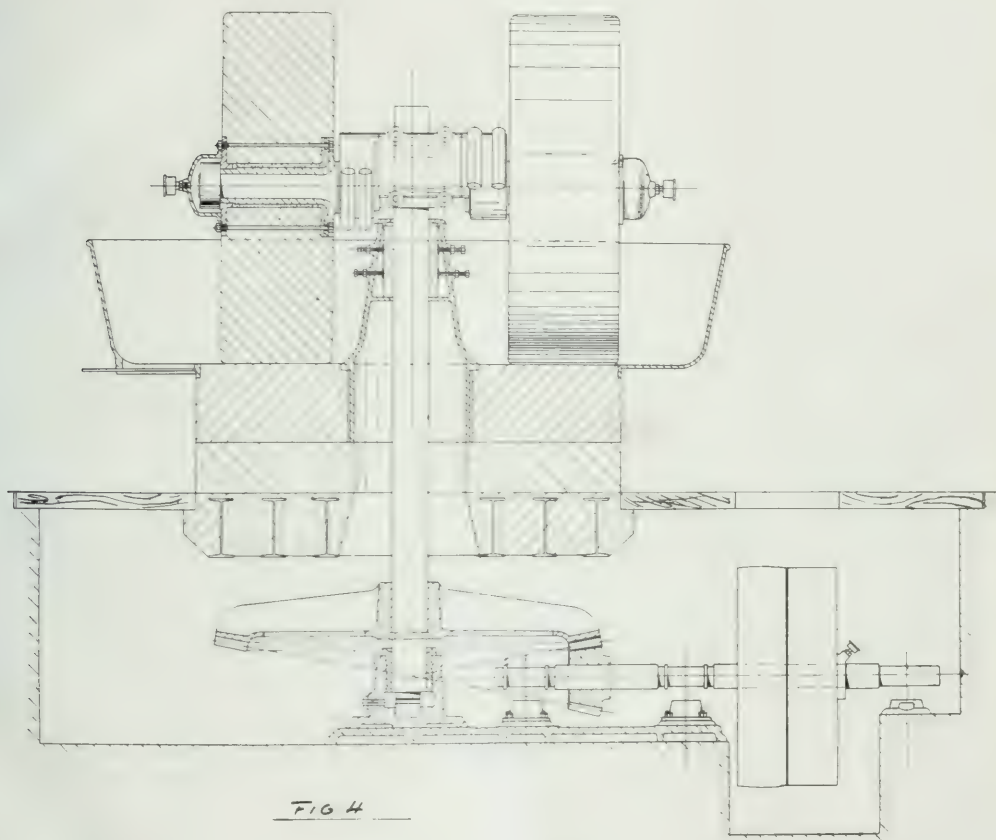


Fig. 4. Kollergang.

clination to run in the direction of W, but are, however, forced to revolve round the vertical shaft and in the direction of W. Hereby a large friction between the bottom stone and the revolving runners is produced causing disintegration of the material to be pulped.

Stones arranged as per Figure 7, are inclined to run in the direction of arrow W, the friction being here still greater. The friction effect similar to Figure 7, is the one in Figure 8.

The number of horsepower required by kollergangs is very low and ranges between 10 to 25 horsepower, according to size, whilst the capacity

will contain from 500 to 2000 lbs. per charge according to the size of the machine. Hereafter, the machine will repulp automatically the waste within one or two hours into a good pulp without destroying any fibres whatever. The pulp is hereafter, emptied by means of a sluice. It is to be understood that no cutting or grinding occurs. The fibres are loose and rolled out of the fibre bundles and are preserved in their full length and strength. An addition of 10 to 30% of broke and old papers (clean white or of ordinary grade) gives the paper a splendid appearance, making writing paper better suitable for the purpose. As

no boiling and the like is required, the loss in working up of old papers is nothing. All the small

destroyed by boiling the material with a proper chemical solution.

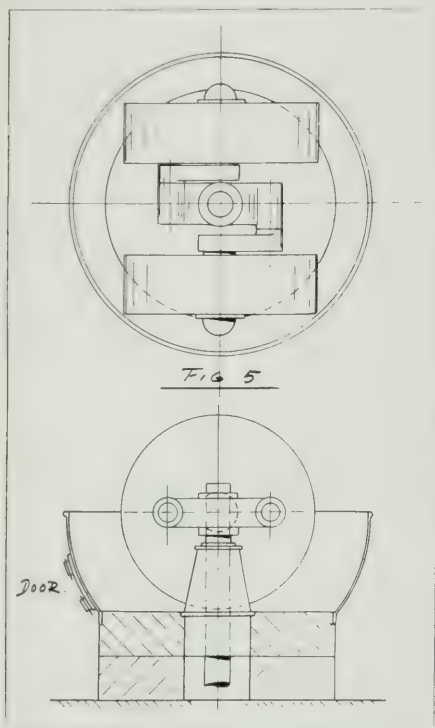
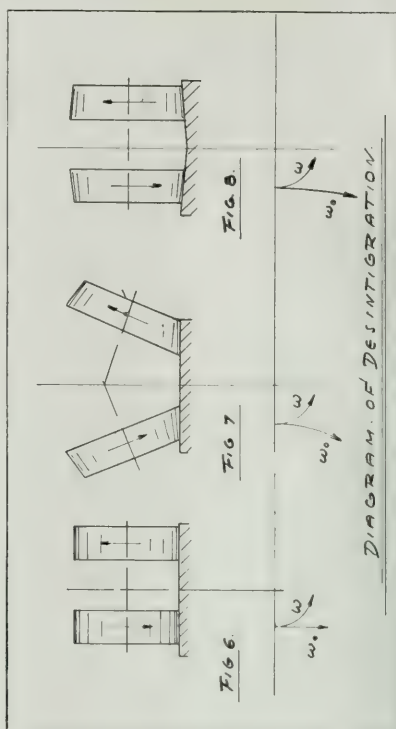


Fig. 5. Kollergang without Scraper.



Kollergangs are also largely used to reduce lime treated straw pulp. The knots are here properly disintegrated and rendered useful. The material of the runners and the bottom stones is hard sandstone, granite or basalt lava.

THE PRINT PAPER MAKER AND THE CONSUMER.

New York, N. Y., December 27, 1913.

Reports are current in this city from various interested quarters of the attitude of print paper makers towards consumers, in recent months. These reports point to a condition which would seem to argue the existence of a comprehensive agreement, both as to prices and to markets, between the American and the Canadian paper mills. The conditions as they are disclosed here reveal a certain uniformity of prices and the lack of competitive eagerness to sell paper that might be construed in the menacing legal phrase into "a conspiracy in restraint of trade and commerce."

Such a condition would engage the prompt attention of Attorney-General McReynolds and the Department of Justice, even if it had not already done so. This administration is alert to detect violations of the Sherman Anti-Trust Law and to punish offenders, and the Department of Justice since has an open ear for those who come to it with complaints and suspicions and facts to support them.

Print paper, such as is used in printing newspapers and the cheaper grades of books, was put on the free list by the Underwood tariff act. When the duty was removed on the Canadian imports, the assumption was that there would arise competition and bidding for the contracts of the paper consumers, and that possibly the price of paper would go down. While this has been realized to a certain extent, certain factors have stated most emphatically that prices have not only remained stationary, but in some cases have even gone up.

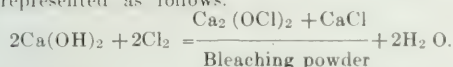
Inquiry at the Department of Justice at Washington at the present juncture is without avail. Mr. McReynolds will not make in advance statements about possible or probable prosecutions. But as these complaints are in almost every case, without support it is barely likely that Mr. McReynolds will pay any attention to them at all. As a matter of fact, newsprints that was selling a year ago for 2.25c. delivered, is obtainable now from some mills at 1.95 c., and others at 2c., 2.05c., 2.10c., 2.15c., etc., up to 2.35c. This is surely indicative of the fact that the lowering of the duty has tended to depress prices, rather than make them firmer.

Notes on Some Recent Studies of the Action of Air and Carbon Dioxide on Bleaching Solutions.

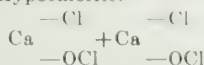
By ROBERT KIRKPATRICK, M.Sc.



AMONG the chemical questions which have not been settled up to date is that, regarding the correct formula for Bleaching powder. For a long time, on account of its preparation from slaked lime by treatment with Chlorine gas, it was supposed to be a mixture of Calcium Hypochlorite and Calcium Chloride. The reaction in this case is represented as follows.



The view that Bleaching Powder consisted of this mixture was opposed by the great chemist Fresenius. He claimed that since Calcium Chloride takes up water very rapidly when exposed to the air, Bleaching Powder containing that salt should also take up great quantities of moisture on exposure to the atmosphere. This is found not to be the case. There are a number of other experimental reasons which tend to show that instead of being the above mixture, it is a double salt of the Chloride and Hypochlorite.



In solution on the other hand, Bleaching powder acts exactly like a mixture of the Chloride and Hypochlorite. This is of course perfectly natural.

The value of a bleach depends upon the amount of available Chlorine, or, the amount of free Chlorine it is able to give upon decomposition. The standard guaranteed and insisted upon is 35% available Chlorine. The actual percentage often runs higher than this and by careful preparation, a 44% product is not impossible. There is a question, however, as to whether or not the product containing such a high percent is as efficient.

The preparation of bleach depends upon the fact that, on treatment of slaked lime with Chlorine gas, the latter is absorbed by the lime and Bleaching powder results. For this, the Chlorine is prepared in two ways. It is produced from common salt (Sodium Chloride, NaCl), either by chemical means or by electrolysis. Thus we have 1) Chemical Bleach and (2) Electrolytic Bleach.

It is a well known fact that Bleaching powder which has stood exposed to the air for a long time loses much of its available chlorine. Thus the necessity for using fresh samples when making efficiency tests.

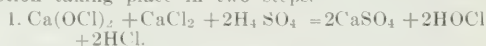
This fact suggests the question, what action if any, has the air on Bleaching powder, and whether small amounts of Carbon Dioxide of the air have any influence on the liberation of Chlorine. The following is a summary of some experimental work done by R. L. Taylor (Jour. Chem. Soc.). These experiments are interesting in that they show, that Carbon Dioxide and air do have a very marked effect on Bleaching solutions.

Taylor tried the action of Carbon Dioxide both moist and dry, on known quantities of Bleaching powder. He also tried the action of purified dry

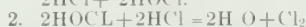
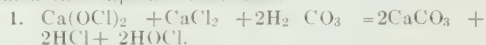
air and ordinary air in the same manner. In all these cases he has an apparatus suitable for testing for Chlorine in the gases given off. It was found that when known quantities of Bleaching powder were treated with moist CO_2 the resulting gases which passed off from the reaction mixture, showed on being tested, the presence of nothing but Chlorine. This of course shows that moist CO_2 has a marked effect on Bleaching powder. Several trials showed this to be the case always. When the same thing was tried using perfectly dry CO_2 it was found that at first only Chlorine was evolved but that this gradually stopped as the powder became dry. This showed that moisture was necessary for the evolution of Chlorine gas.

Taylor explains the above reactions as follows:

It is a well known fact that sulphuric acid will liberate the Chlorine from Bleaching powder, the action taking place in two steps.



Since the reaction which takes place in the presence of moist CO_2 is the same as above, he claims that the CO_2 and moisture produce carbonic acid (H_2CO_3). Although this is a very weak acid Taylor claims that it is strong enough to decompose the bleach in a manner similar to that in which the sulphuric acid does.



It was found that pure air containing no CO_2 was passed through the Bleach solution, small amounts of Hypochlorous acid (HOCl) were produced. This is explained by assuming that part of the Bleaching powder is hydrolysed slightly as follows:



The most remarkable thing of all however, is the effect of ordinary air on Bleach solutions. It is of course well known that air contains a small quantity of Carbon Dioxide. At first the action of ordinary air produced an evolution of Hypochlorous acid. This diminishes rapidly until nothing but Chlorine gas is given off. Thus it is seen that there is a similar result produced by both CO_2 and ordinary air on Bleaching powder.

The observations of these experiments can be summed up as follows:

1. Purified air gives rise to a small amount of Hypochlorous acid when acting on a bleach solution.

2. Ordinary air at first causes the evolution of Hypochlorous acid in small amounts which gradually diminish until nothing but Chlorine is given off.

3. Pure CO_2 on bleach causes only the evolution of free Chlorine.

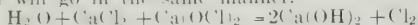
It is a wonderful thing that the effect of small amounts of Carbon Dioxide such as are found in the air should be so similar to that when pure CO_2 is used.

There are many compounds which are analogous to Bleaching powder in both chemical and physical properties but which are not cheap enough to use on a commercial scale. In a case like the above they are handy in that they furnish a means of comparison with bleach. It is, for example, well known that a mixture of Sodium Chloride and Sodium Hypochlorite in solution is analogous to

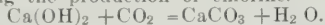
a bleach solution. ($\text{NaCl} + \text{NaOCl}$) This mixture is prepared by the action of Cl on caustic soda (NaOH).



It is also well known that this reaction goes in the opposite direction and is therefore reversible. It is natural to expect then, that a bleach solution will go in the same manner.



Since the action is reversible a point will be reached at which both reactions balance. The carbon dioxide of the air would then tend to keep precipitating the Calcium as carbonate from one half of the reaction thus preventing equilibrium and increasing the production of chlorine.



This then explains the action of ordinary air upon bleaching solutions and I believe that the action of pure CO_2 is due to the same action. This explanation coincides best with our knowledge of the chemical action of Carbon dioxide.

This work is very interesting from a point of view of the manufacturer who uses bleach and desires to get the highest efficiency.

Belting

Do you keep a record of the duration and cost per day of every belt in your mill?

If you don't, start in to-day and you will in due time have figures that will set you thinking and make it possible for you to save a good slice of your belt bill?

Keep the record as detailed as possible!

It is a serious mistake to buy a belt, only because it is cheaper than other kinds and qualities; a cheap belt may not run more than a few months where a belt at the double price may run for years.

The kind of belt to be selected depends on the conditions under which it runs.

The old established leather belt is, as very expensive in first cost, not to be recommended in damp places or where it is subjected to high stress or where it is apt to be mechanically injured. It will work with great economy for transmitting power from steam engines, electric motors, etc., where they work under favorable conditions, also as driving belts for small machines as in a machine and carpenter's shop.

The woven cotton belt is in many cases the most suitable belt for pulp and paper mills. They are comparatively cheap in first cost, work well in moist places and do not slip easily if not too dry. The belt woven of fine, hard twisted yarn, the visible thread parallel to the belt is usually the best. It must be kept in mind that cotton belts shrink considerably by moisture and should therefore not be used where they are subjected to alternately getting wet and dry as the belt has to be well tightened not to slip when dry and when moistened will shrink and may bend the shaft and will make the friction in the adjoining bearings large thus causing loss of power.

Cotton belt made of sheets of canvas, sewn together is the cheapest in first cost but should only be used where the belt is subject to only very small stress as the sewing otherwise is rapidly worn out and the sheets separate.

"Grip belt" belts are more expensive than cotton belts but do not stretch as much and there-

fore cause less shut downs for "taking up." The welt, made of hair, is apt to rot and the life-time of this kind of belt is not very long. This kind of belt has, however, proved to work better than any other on heated pulleys, for instance on hot gas fans, because the hair welt insulates the inner cotton warp.

Rubber belts are uniform in width and thickness and do not stretch very much. They are suitable for machines where the stress is varying, as for instance, on wood chippers, as they spring to some extent without injury, are of considerable weight and adhere to the pulleys, thus preventing slipping, which is usually not the case with other belts when subjected to varying stress. They also run well vertically, depending on their large weight and are therefore extensively used for driving the different divisions of paper machines driven from over-head main shafts.

Balata belts are undoubtedly the best belts for transmitting power for any distance. They are light in weight in comparison to the power they can transmit, but need large pulleys as they have low adherent properties. They run well as half crossed belts but are very sensitive to moisture as this makes them slip easily.

For large distances as well as under certain conditions, specially for transmitting large amounts of power, it is cheapest to use rope drives; it is, however, outside the frame of these notes to go further into this particular kind of power transmission.

In designing a mill or a machine attention should be paid to ample dimensions as to diameter and width of pulleys. The extra cost of good sized pulleys is a mere trifle compared with the difference in cost of upkeep of belts running under high and low stress respectively.

When you decide on the thickness of a belt, take size of pulleys, power, speed and center distance in consideration. Remember that if you choose too light a belt, its life time will be short as the stress per square in. of sectional area will be large but remember that also a too heavy belt does not run well on a small pulley and that it adds to the friction in the beamings concerned.

A belt is like a pair of gloves in as much as workmanship and raw materials used have much more to say than the price and therefore a well known "brand" is often to be preferred though the price usually is considerably higher.

The limits of H. N. Price & Co., which were offered for sale on Wednesday, December 17th, in Quebec, by Messrs. Larue & Trudel, were put up at a knock-down price of \$135,000. No bids were received and the property was withdrawn.

The Wayagamack Pulp & Paper Co., Ltd., have placed an order with the Sherbrooke Machinery Company for two three-roll hydraulic wet machines equipped with their sectional built up press rolls and spirally wound couch roll. Belgo Canadian Pulp and Paper Co., have also ordered three Sulphite Thickeners of their latest design and Henry Paper Company, Lincoln, N.H., are ordering a wet machine to be shipped across to the United States. This latter is an interesting fact, because it is so unusual to see Canadian machinery manufacturers supplying United States paper mills, and is a compliment to the Sherbrooke Machinery Company's work.

NOTES ON STEEL

SOME HINTS ON HARDENING AND TEMPERING

The following article by Mr. R. B. Hodgson, Member of the Institute of Mechanical Engineers and of the Crooks-Roberts Co., Sheffield, England, should be interesting to paper mill men, who are always anxious to know the materials which are used in all departments of the mill. The Steel used in the beater bars is always an important problem.



HE hardening of steel has been studied by numerous metallurgists, who have given a great deal of time and thought to their investigations with a view to establish a satisfactory theory to account for this very marked phenomenon in connection with steel. The theories brought forth by these eminent metallurgists are both numerous and varied.

In connection with the heat treatment of steel, microscopical evidence has proved most valuable, and I believe I am quite correct in stating, that if two samples of carbon steel selected from two different and distinct sources, but each giving approximately the same chemical analysis, be prepared for microscopical examination under normal conditions, their appearance will be practically the same.

Alloy Steels.

In reviewing carbon steel we see that an increase in the percentage of carbon is attended with increased hardness. In these days, however, we cannot base the definition of steel entirely on the peculiarity due to carbon, since there are other elements that can confer hardness to the iron. Iron readily alloys with different metals, such as aluminium, chromium, molybdenum, manganese, nickel, palladium, platinum, thodium, titanium, Tungsten, uranium, vanadium, and many very important and remarkable results are obtained from the resulting alloys. The only metals that we need consider for our purpose are chromium, manganese, and Tungsten since alloy steels containing these three metals lend themselves to, and are particularly suitable for cutting tools, which have to deal with work under conditions such that require the tool to be not only harder than can be expected in the case of ordinary carbon steels, but also capable of greater endurance under the two special circumstances of modern increased speeds, or to deal with the machining of very hard materials.

Chromium is used extensively in the production of special steels, as armourplates, axles, projectiles, and tool steels. The chrome iron-ores as found in either Asia Minor, Bohemia, France, Norway, North America, Silesia, and Shetland Isles, are the sources from which the alloy of iron with chromium is obtained. Ferro-chromium is prepared as a commercial article in a variety of grades, having different percentages of carbon and chromium. A grade specially valuable and used in the manufacture of high-class tool steel is 0.5 to 1 per cent. carbon, and 65 to 70 per cent. chromium. In the finished tool steel, such as very hard turning tools, the quantity of chromium varies between 2 and 3 per cent.

All steel contains some manganese, although the narrow limits of its contents 0.2 to 1 per cent., as usually present in ordinary finished commercial carbon steels, does not materially influence the properties of the steel. Manganese

frequently occurs in iron-ores and is partially reduced along with the iron, 5 to 20 per cent., Manganese will result in the production of a white pig-iron in a highly crystalline condition, containing a large amount of carbon in chemical combination, this is called "spiegeleisen," on account of the beautiful bright appearance of its crystalline plates, a condition which disappears if the manganese is increased above 20 per cent.

An alloy used extensively in steel making is that known as ferro-manganese, containing from 75 to 87 per cent., manganese alloyed with steel, manganese produces a material that is hard, tough, strong, and non-magnetic, and gives varying results according to the percentage. If 1 to 3 per cent. manganese be present the steel is brittle and unworkable, and up to 7.5 per cent. the steel may be likened to glass for brittleness, and beyond 7.5 per cent. the extreme hardness begins to disappear, but all manganese alloys possess extraordinary qualities of hardness combined with toughness, such as do not occur in the case of any other alloy. Manganese steels are so hard that they cannot be machined, but may be forged into various shapes as easily as very mild steel, and the ordinary process of quenching in water toughens but does not harden manganese steel, sudden quenching at a high heat will improve the tensile strength and elongation.

Tungsten is chiefly prepared from wolfram ore, and the metal readily alloys with iron to form ferro-tungsten, when alloyed with carbon steels tungsten plays an important part in helping to confer great hardness upon the steel, but in the absence of carbon, the presence of tungsten will have very small influence on the physical properties of the steel. Further, whilst tungsten has practically no appreciable effect on the magnetic properties in low carbon steels, it is of great value in high carbon steel, since by its coercive-power with regard to magnetism it greatly increases the power of the steel to retain the magnetism, consequently tungsten is an important metal in connection with special magnet steels, and a high percentage will improve the magnetic properties of the steel very considerably, the composition of the steel used for permanent magnets is somewhat similar to a special tool-steel but as a magnet steel is not required for cutting purposes, its composition is arranged so as to make most effective its properties of retaining magnetism.

The addition of tungsten will impart a fine-grained structure to a carbon-steel, and the fracture of a tool steel containing about 1.3 per cent. carbon and 3 per cent. tungsten may be likened to a mole's back so fine and velvety is the grain.

Self-hardening steels are alloys of iron, carbon, tungsten, and manganese, and in some instances chromium and other metals are added to bring

about certain improvements in the qualities of the steel. These steels are called self-hardening, because if they are heated to a temperature of about 1,200 deg. C. nearly a welding heat, and allowed to cool in the air, they become very hard.

Hardening in General.

The hardening and tempering of a piece of steel is an operation which to the casual observer may appear a very simple one, but it is undoubtedly one of the most delicate operations in connection with mechanical art.

The quantity and variety of tools and other steel articles that are handled in the Midlands, are so numerous, that it is hardly possible to give a detailed description of the rules and methods for forging, hardening and tempering that can be applicable to the whole.

There are certain fundamental laws and principles relating to these matters, and if these are duly and properly observed, and correct methods adopted, they will invariably lead to satisfactory results. In my book, "Machines and Tools employed in the Working of Sheet Metals," which was published in 1903, I mentioned how necessary it is to exercise special care in heating a tool to the required temperature before plunging it into the cooling bath for quenching, the principal points of importance to remember being gradual and uniform heating, and the quenching to be done in a plentiful supply of fresh clean water and brine, or rain water and brine.

A steel high in carbon will harden at a low heat. as compared to the temperature necessary for a steel containing a low percentage of carbon, which fact makes it essential for the workman to have some knowledge as to the carbon-content of the steel he is handling, also he should at least have an approximate idea as to the correct temperature to which the steel had best be heated, what an important item the latter is—will be seen when we come to consider the actual application of the recalcence curve for fixing the correct hardening temperature.

At all stages in its manipulation, steel should be thoroughly and uniformly heated, that is in the forge and rolling mill, in the smith's shop, as well as in the hardening and tempering shop, for if a piece of steel is hotter in one part than another, the expansion is necessarily variable, consequently contraction in hardening will also vary, there being higher tension in one part than another, resulting in either a warped or cracked tool.

In the forge irregular heating means irregularity in forging, consequently inequality of tension in the article when in the rough forged state. But a reasonable amount of care on the part of a blacksmith will prevent trouble from this cause.

The Hardening Furnace.

The difficulties of uniformly heating a piece of steel in an ordinary blacksmith's fire, or in a coal fired furnace, are far too well known to need much comment from me. In the case of the coal fired muffle, by exercising a certain amount of care, by occasionally turning round the steel, and by using a pyrometer in the muffle, it is possible to partly overcome the difficulties, but at all times experience and good judgment is necessary. Probably the next best way to ensure a regular heating is to use a gas fired muffle or furnace, which can be readily arranged to maintain an even and correct temperature by adjusting the gas supply, and in this way considerably reduce the risk of burning the steel and should a workman be unable to remove a tool

immediately it is ready for quenching, the application of a pyrometer will guide him and so prevent disaster. An incidental advantage of the gas fired furnace is the increased cleanliness, due to the freedom from smoke and dust, which are inseparable where the ordinary blacksmith's fire or coal fired muffles are employed.

The Sand Table

Every Paper, and Pulp Maker, knows what a Sand Table is, and the intention with which it is erected, but many men who erect them, have never thought seriously on the theory of the arrangement. To get to business, the commonly accepted theory of a sand table, is, that it is to get rid of the heavier particles of dirt, which ought not to be among the fibres, but nevertheless always are. Well, the writer considers, that the Sand Table should not only be used, to get rid of the heavy dirt particles, but also be utilized to get rid of the light floating particles, as far as possible. It may be as an axiom, that whether one makes Pulp or Paper, that the flow of fibre and water, over the Sand Table should be steady, and regular. Heavy particles desire to sink to the bottom light particles desire to rise to the surface; but fibres of whatever kind, have a most objectionable habit of clinging to foreign matters. If they want to float the fibres hold them down, if they want to sink the fibres hold them up. It follows, from the uncontrovertible fact, that the broader and shallower the Sand Table is, the fewer fibres will the foreign particles have to fight against to get either upwards, or downwards, as their composition may incline them. Therefore the boarder and shallower the Sand Table is, the shorter it needs to be, and the sooner will the foreign particles get where they ought to be. The question now comes, how can these particles best be got rid of. We will take the heavy particles first, as there are generally considered most of them.

A common form of Sand Table consists of a series of riffles, that is, a frame, lying in the Sand Table proper, with a number of boards set at an angle of about forty-five degrees to the bottom, the fibre and water flow over these riffles, and it is supposed, that the heavy particles fall in between these boards, and rest where they fall, but they do not. Take an ordinary brook for example with ridges of rock, running across it, do you find much sand in the shelter of the ridges. No! you find a little, but not much, simply because every ridge makes a certain boil of the current, and many of the particles which ought, and want to settle, are carried along over ridge after ridge.

In practice one finds that between riffles, one gets a small proportion of dirt, and a large proportion of fibre. This fibre is practically all going to be wasted, because when a washing up has to be done, the fibre supply is shut off, and the water allowed to come on by itself, it cannot get at the settled fibres, and they are pretty well all lost.

Now is it not common sense to have your Sand Table arranged so that your fibre and water are drifting along quietly over a smooth floor arranged on a slight gradient so that the flow may be as slow as possible, consistent with the supply of the machine, and that this floor, should have at inter-

vals, a box trap, about twelve inches wide and eighteen inches deep; into which the heavy particles which have sunk and are slipping and rolling along the smooth floor will naturally fall. One such box trap will do better work than twenty riffles, and the waste of fibre will be much less than when washing on the riffle plan. The adjustment of width of Sand Table, length, speed of flow, and number of box traps, depends entirely on size, and speed of machine, and on quality of materials used. So much for the heavy foreign particles, now, what about the light ones. These in general washing are generally allowed to go right along on the screens, which retain the large ones and pass the smaller ones. The writer suggests an arrangement which gives very good results, and is simple and easily arranged. The last few feet of sand table has a considerably steeper downward incline, than the first portion, at the top of this incline, what may be described as an adjustable slice is arranged, at a suitable angle. This is so set, that the floating particles are checked, thrown back slightly, and sucked off, the surface by an overflow, which discharges into the baby or auxiliary screen where the larger ones are retained, and such of the small ones as get through, do not matter much as the discharge from this screen delivers back to the commencement of Sand Table, and they get caught again as they come round.

An excellent form of Sand Table, is one, arranged so, that by a worm wheel gearing, it can be turned up at right angles, and be hosed clean in a very few minutes. This means a lot of time saved, in comparison with the laborious and disagreeable job of brushing, and hosing out a fixed table. It might be well to mention the fact, that in most cases Sand Tables are set much too high, so that before the fibre, and water reach the breast roll of machine, it has travelled over a wonderful arrangement of splashes and waterfalls, and is consequently full of froth bells which are most undesirable. Arrange your Sand Table to flow at just sufficient speed to prevent the fibres from sinking too much to the bottom. Then allow your fibre and water to slide quietly into the screens and from them quietly slip onto the wire. Working this way it is an absolute certainty that you will get fewer blotches and cleaner and better paper.

ALEX. ANNANDALE.

TRADE ENQUIRIES.

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Pulp and Paper Magazine" may obtain the names of enquirers by writing to the Department of Trade and Commerce, Ottawa, Ont., and stating the number of the enquiry.

2240. Lumber, clear pine.—A South African importer asks for quotations on Canadian clear pine all sizes, planed four sides.

2241. Lumber, pine shelving.—Inquiry is made for quotations of Canadian pine shelving, quality 2, 1 inch x 12 inch by 12, 14 and 16 feet long.

2242. Lumber, poplar boards.—A South African importer asks for quotations on Canadian poplar boards $\frac{3}{4}$ -inch to 1-inch x 12, 14 and 16 feet long, planed four sides.

2257. Wrapping paper.—Samples and prices are requested by a South African merchant.

2258. Paper bags.—Samples and prices are asked for by a South African importing house.

2259. Lumber and timber, all kinds.—A South African importer asks for quotations on all kinds of Canadian lumber and timber.

2268. Lumber.—Inquiry is made by a South African importer for quotations on poplar boards $\frac{1}{2}$ -inch and $\frac{3}{4}$ -inch planes, 12 to 16 feet long.

2269. Spruce deals.—An East London importer asks for quotations on Canadian 3-inch spruce deals.

2274. Wrapping paper.—Samples and prices are asked for by a South African importer.

2275. Paper bags.—A Durban firm asks for samples and prices on Canadian-made paper bags.

2343. Pulpwood.—Manufacturers and exporters of mechanical and chemical pulpwood are invited to get in touch with Paris agent.

Full reports have just been received of the damage done by the huge storm of November 9th, and Aubrey White, Deputy Minister of Lands and Forests for Ontario, is making arrangements to have the fallen timber taken out this winter, before it is attacked by "borers" next summer. On lands under timber license damage was done in thirty-four townships. The storm centre was a short distance north and east of the Saulte Ste. Marie, and east of the township of Merrick on the Temiskaming and Northern Ontario Railway, below Temagami. The attention of the licensees has been called to the damage and steps are being taken to save the blown timber although its removal will involve considerable expense over ordinary lumbering. To Crown timber the chief damage occurred in the Mississauga Forest Reserve and here eight limits, equal to four townships suffered. The licensees are operating at this point and the Department is insisting that they take out the slashed timber before it becomes a total loss, which has brought a request from the licensees for certain concessions if it is all taken out. North of Sudbury the damage was not as bad as was at first reported and arrangements have been made with the contractors on the construction of the Canadian Northern line in the district to cut the damaged timber for their work. In Janes and Dana Townships there was a serious blow down of about five and a half million feet board measure. An offer was received from Gordon & Co., lumbermen, who carrying on operations close to the devastated stretch, for five dollars per thousand board measure for the fallen timber and \$12.25 per thousand feet for what remains standing. This offer has been accepted. There does not seem to have been any damage in the Rainy River and Port Arthur districts or north of Lake Superior or in the Timagimi Forest Reserve.

The new State insurance legislation of Ontario, has been favorably commented on in many quarters in Quebec and if the act should work out as well in operation as it promises in theory, in the opinion of employers an attempt should be made to have a Dominion statute framed along similar lines providing this is constitutional. If not it has been suggested that the matter should be brought before the various provincial governments with a view to having like measure adopted, making a uniform system from coast to coast.



NEW PATENTS



Judson A De Cew and Robert J. Marks are co-inventors of a new Double Beating Engine, hav-

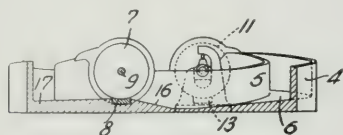


FIG. 1.

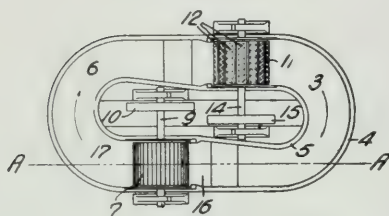


FIG. 2. 149148

ing the inner and outer walls spaced apart according to the regular Marks design. The beater trough is as shown in the diagram.

DANDY-ROLL.

By Albert C. McDonald, of Kalamazoo, Mich.

U. S. Pat. No. 1,071,329.

This invention relates to new and useful improvements in dandy rolls and is designed particularly to construct a device of this nature which will increase the efficiency of devices of this type. Dandy rolls are used upon the wet end of the paper machine and are designed to finish the top side of the paper and also water mark the same. As these rolls operate upon the paper while the same is in a soft or pliable condition, they will naturally gather or accumulate a quantity of foam water, and stock, which must be discharged by some method if the roll is to operate properly. In the rolls heretofore used, an attempt has been made to produce such a discharge preferably at the ends of the roll, but it has been found that these rolls have not been very successful, and in the majority of instances the rolls have become dammed and fail to operate as desired. The present invention is designed to overcome this objectionable feature in the rolls now in use by providing a means whereby a continual discharge may be had at the end of the roll, keeping the water clear of accumulated foam and water and thereby preventing the rolls from damming.

Figure 1 is a diametrical view illustrating the end of the roll flattened out. Fig. 2 is a side elevation of the dandy roll illustrating the various sections thereof broken away for the purposes of illustration.

Referring to the drawing, 10 indicates a metal ring located at each end of the roll having a number, preferably 4, of radially extending arms, 11 located upon the interior thereof, whereby a stub shaft 12 is secured to each ring 10 for the mounting of the roll. A plurality of parallel longitudinal ribs or wires 13 are interposed between the heads or rings 10, said ribs or wires 13 constituting the inner surface or base of the shell of the roll. A pair of parallel wires 14, spaced substantially one-half inch apart are wound spirally above the ribs or wires from one plate 10 continuously to the opposite plate, 10, forming a channel upon the exterior of said ribs or wires 13, of about one-half inch in width. This channel is particularly constructed to conduct the foam, stock and water gathered by the dandy roll to the ends thereof, in order that the same may discharge, and the utility of the roll be in no way impaired thereby. In order to brace these channel forming wires 14, and to prevent any longitudinal movement thereof, a wire 15 is interposed between the wires of each set. This wire 15 is staggeredly arranged between the adjacent wires 14 and is secured to said wires by a soldering or other suitable means at equidistant intervals, as is clearly illustrated in the drawing. From this

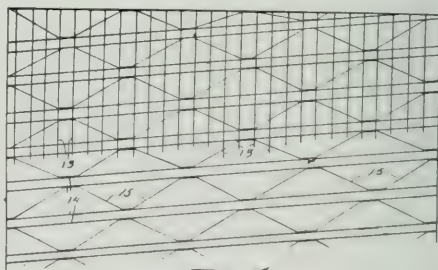


Fig 1

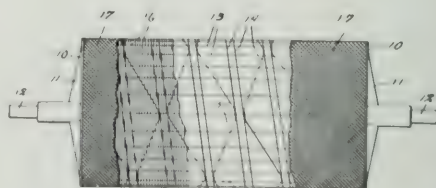


Fig 2

construction it will readily be seen that the wires 14 forming in combination a conducting channel, are prevented from any movement whatsoever upon the wires or ribs 13, and are retained by the wire 15 in a fixed position. The entire structure is wound

with a spring brass wire 16 which extends throughout the entire length of the roll and completely covers the entire mechanism. An outer cover or brass wire gauze or cloth 17 encases the entire shell or roll and constitutes the bearing surface thereof.

By the foregoing construction it will be seen that as the roll operates upon the wet paper, the foam, stock, and water will pass through the brass wire, cloth or gauze 17 through the winding wire 16 and into the interior of the shell. The water, foam, etc. will naturally, by gravity, be retained at the lower terminal of the vertical diameter by the roll, and thus will be positively contact with the channels formed by the wires 14. The rotation of the roll will therefore carry the foam, stock, etc., to one end of the roll, where it will be discharged.

* * * *

PAPER MAKING SUCTION ROLL.

By Robert Marx, London, England, Patentee.

Can. Pat. No. 147,950.

Suction roller vacuum couch roll comprising in combination a stationary inner suction box not capable of radial movement, an outer shell revolving thereon and longitudinal and transverse packing bars adapted to be pressed against the outer shell by means of water pressure.

* * * *

PAPER-BOARD.

By Charles S. Bird and George R. Wyman, of Walpole, Mass., Patentees.

U. S. Pat. No. 1,074,829.

The invention pertains to an improved paper-board, its construction and advantages.

Paper-board has of recent years come into somewhat extended use and its field of application is widening, this primarily by reason of the fact that lumber is becoming more and more expensive, and for the further reason that the manufacturers of such board are producing a better article than formerly. There is present, however, in the usual commercial paper-board of today one inherent defect which renders it unsatisfactory for many purposes, namely, the tendency to warp and buckle prior to or after it is positioned.

The main object of the present invention is to produce a board which will maintain its evenness and present a smooth surface or face, particularly so after it is fastened in place. This is accomplished primarily by charging the board, during its process of manufacture, with an appreciable amount of moisture, which moisture is, after being applied, slowly given off during a considerable period of time. Thus, when the board, with a certain percentage of contained moisture, is secured in place around its edges by tacking it, which is the usual manner of fastening the same, it becomes taut and maintains such position or conditions indefinitely.

* * * *

W. W. Andrews, Regina, Sask., formerly professor at Mount Allison University, Sackville, N.B., has patented a new roller for distilling Cellulose, Canadian Patent No. 149160.

A METHOD OF OBTAINING WATER-SOFTENING MATERIAL FROM SULPHATE LYES.

By Dr. W. Gunther, Karthausersrtasse 32, Kassel, Germany, Patentee.

British Pat. No. 9867.

This process relates to a method of obtaining water-softening material from sulphate lyes resulting from the boiling of organic substances, such as wood, straw, or peat, with alkalis. Sulphate and other alkaline lyes, both in dilute and concentrated solutions, have been employed in the softening of water; and drying has been resorted to with a view to recovering the alkalis, without paying attention to the organic substances containing therein. These defects are obviated when the drying is effected at as low a temperature as possible in order not to destroy the organic substances. When the evaporation is conducted under vacuum, and the layer to be dried is kept very thin, the process is accelerated, and the product obtained retains all its original contents.

The stability of the dry substance thus obtained is increased by fixing the free alkali by means of gaseous carbon dioxide, the fixing process being accelerated by the use of gases rich in carbon dioxide, and treating the lyes so as to fix the free alkali before the drying operation takes place.

TESTING METHODS FOR SULPHITE AND SULPHATE CELLULOSE IN PAPER.

By Prof. C. G. SCHWALBE, Eberswalde.

Several methods exist to recognize sulphite and sulphate cellulose in cellulose cardboards, for instance Klemm's Malachit-green—Rosanilinsulphate—test, and Schwalbe's method to test for rosin with anhydrous acetic acid and concentrated sulphuric acid. The latter method can, of course, not be used to determine sulphite and sulphate celluloses in paper as a mixture of fibres, poor and rich in rosin, may be at hand in the paper, as well as rosin from the size. Klemm's method is only with very wide experience successful under the microscope, as it is difficult to observe the fine color differences.

A simple method to recognize the mentioned two kinds of cellulose does not at present exist. The problem is hard to solve, because the celluloses, both manufactured from wood, are closely related. Small differences in color are certainly noticeable, if small samples of sulphite and sulphate celluloses are colored in separate vessels beside each other with color solutions of the same strength and in the same manner, but these differences nearly completely disappear under the microscope. Satisfactory reactions for the two kinds of cellulose may be expected in two ways: by means of the incrusting substances or by means of the changes in the celluloses, which have been caused by the digesting process. A cellulose for instance, which has been previously treated with an alkali, but afterwards completely washed out, absorbs, if again placed in alkali, more of this than a cellulose, which has first been treated with acids. The same applies to alkaline copper solution; soda-celluloses take up more copper from such a solution than sulphite-celluloses. It is, however, rather difficult to make

the copper visible under the microscope. Red particles of copper oxide may be noticed in the fibres when alkali-copper is reduced with dextrous and Seignette salt, but these particles are only faintly colored and irregularly distributed in the fibres. Also the transforming of the alkali-copper into black-copper sulphide does not give the desired result. The quantities of sulphide of copper separated out are so small and so finely distributed, that no black color, but only a brownish coloring is obtained. The freshly formed ferrocyanide of copper leaves the fibres and goes into the solution, is "bled out" from the fibres, if it is tried to make the alkali-copper visible by means of ferrocyanide of potassium. The copper taken up by the fibres may, however, be made visible by means of organic coloring substances. The red dye, Benzopurpurine 10B gives intensively blue colorings with copper-containing substances, depending upon the forming of a so-called copper lake, the copper salt of the pigment acid from the coloring substance. It is however, rather difficult to strike the exact conditions favorable for the forming of the blue combination.

This method to color the copper-containing fibre with benzopurpurine 10B becomes of more use, if the copper is fixed on the incrusting substances instead of on the cellulose. Sulphite cellulose takes up more copper than sulphate cellulose, when boiled in a solution of sulphate of copper; the copper remains even after energetic washing with hot water. The coloring with Benzopurpurine 10B gives very good results with unbleached, but it is sometimes not much of a success with bleached celluloses, because it is difficult, as mentioned above, to strike just the correct degree of coloring and washing out.

The desired result is obtained in the easiest and most reliable manner with an iron pigment. Unbleached sulphite cellulose takes up much more iron from a very diluted solution of chloride of iron than unbleached and bleached soda cellulose. If the fibres loaded with iron are vigorously washed with water and put in diluted sulphuric acid, to which a little of a solution of ferrocyanide of potassium has been added, so will the fibres of sulphite cellulose become colored deep blue, while the fibres of unbleached soda-cellulose become yellowish-greenish-brownish and bleached soda-cellulose fibres not colored at all or only faintly bluish. A blue coloring consequently makes the sulphite cellulose fibres recognizable under the microscope.

The following manner of executing the test has proved to be especially practical. The paper is first shredded on a common almond or chocolate shredder. It is absolutely necessary in order to obtain an even coloring to disintegrate the paper so finely, as many soda-cellulose papers containing sulphite cellulose will not become disintegrated by cutting with water, even with use of glassbeads. The use of soda lye for disintegrating the paper, is not advisable with other preparations of this kind, as the soda lye dissolves parts of the fibres, which would become changed on account of swelling up. The resin is eliminated from the shredded material by means of alcohol and ether, so that it may not prevent the absorption of iron by the fibres. The disintegrating process is a bleached formation of fibre lines with very strong soda-cellulose, which causes difficulties in the microscopical test. The desired result is not true disintegration is obtained if the paper is first extracted with alcohol and ether, then

boiled for about fifteen minutes with distilled water, and afterwards shaken with glass beads. A N divided by twenty (one-twentieth normal), solution of chloride of iron is now poured over the dry material on a water bath, and it is kept there so long at a temperature of 60° to 80° C. until the fibres, which in the beginning rise to the surface, have sunken to the bottom of the vessel, for which about half an hour is required. The pulp is then filtered off and washed with cold, or better with warm distilled water. The fibre particles adhering to the re-action glass above the surface of the liquid must be carefully swept off with some filtering paper, before the fibre pulp is poured out for filtration, because they have not absorbed sufficiently with iron, as they have not been long enough in contact with the chloride of iron; they consequently remain uncolored in the following coloring process, and can thus cause errors. The washed fibre material is now treated with sulphuric acid of 1% strength; 4 to 8 drops of 2% solution of ferrocyanide of potassium are added and all is afterwards heated on a water bath to 60° to 80°C. for 5 to 10 minutes. During this time the fibre material takes on a green or blue color; the last named coloring usually gives the best microscopical results. If the coloring is not enough blue, so may an after-coloring be effected with a few more drops of ferrocyanide of potassium solution, after having added more sulphuric acid. The liquid is then filtered off but first after the uncolored particles adhering to the glass again have been very carefully washed off, and the filtrate washed out. Microscopical preparations are made from the still moist fibrous material; the percentage of the weakly colored soda-cellulose fibres in comparison with the strongly colored sulphite-cellulose fibres, may be figured out by actual counting.

The method was first tried on a number of cellulose papers, which contained known quantities of unbleached soda and sulphite-cellulose, and has been found reliable. It is probably the incrusting substances, which hold the iron in combination; this seems at least to be indicated by the brighter shades on bleached celluloses containing only little incrusting substances. Only a repeated use of the method in the practice can give experience to judge, if there are any celluloses very low in incrusting substances among the very numerous market brands for which the method may not be useful.

The ratepayers of Chatham, Ontario, recently voted on a by-law for granting a bonus to Sommers Brothers Match Company, of Saginaw, Mich., who propose establishing a Canadian plant. The measure was defeated as it failed to secure a majority of two thirds of the ratepayers voting.

W. A. Preston, of Fort Frances Lumber Company, Winnipeg, in Montreal this week said that if steps were not taken to conserve the forests in the newer part of Ontario, they would disappear in twenty years. He advised re-forestation.

For the month of October the Canadian Western Lumber Company Limited, and the Columbia River Lumber Company, Limited, sold 8,107,000 feet of lumber, as compared with 13,753,000 feet in the corresponding month of 1912. From January 1st to date, the lumber sold amounted to 138,793,832 feet, as compared with 157,602,500 feet last year.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

The Monroe Bridge Company, a new corporation with a \$35,000 capital, which recently bought the business of Ramage Paper Company at Monroe Bridge, Mass., is made up of the following officers: Martin A. Brown, president; George A. Greene, Treasurer and Manager. The property includes not only the mill but the whole village of Monroe Bridge. The business will be increased, since the mill having connection with the water powers on the nearby rivers, will have all the power it needs during the seasons of slack water at its own plant.

Complaint from his district on the interpretation of the tariff law in regard to straw pulp was taken up on December 17 in Washington by Representative Treadway, who will consult Representative Underwood on the subject and if necessary will appeal to the Treasury Department. Under the old law, Mr. Treadway was informed, this pulp was taxed at 85 per ton. By the new law, it is argued, it should come in free, but instead the duty has been increased to \$7 per ton. Finally, the complainants assert that although the duty has been raised on the raw material, instead of being wiped out, the protective duty on the finished product has been lowered.

Increases averaging 12c. a hundred pounds in freight rates on wrapping paper and pulp wood, in car loads, from Mississippi shipping points to Baltimore, Philadelphia and other eastern points, were suspended on December 17 by the Interstate Commerce Commission until April 17, pending investigation.

An official of the United Paper Board Company, commenting on the business of his company stated to your representative this week: "The nature of our business of course depends on general trade conditions, and while things are not as good as could be desired, we are getting fair volume of orders. I am not as pessimistic as some people, and think after the questions which are now hanging fire in Washington, are settled things will work out all right." It has been announced that the capital of the United Box Board Company, has been reduced from \$15,000,000 to \$15,000, which is the final step in the reorganization.

An involuntary petition in bankruptcy has been filed against the Niagara Coated Paper Company by the Eddy Paper Company of Three Rivers, Mich.; the Caseing Manufacturing Company of New York; and the Monarch Paper Company, of Kalamazoo, Mich. The petitioning creditors claim the Niagara Paper Company admitted its insolvency to them in writing about four months ago. Judge Hazel, at the request of the creditors, appointed Charles J. Staples, of Buffalo, N. Y., temporary receiver of the company's property and directed him to continue the business until further notice. Mr. Staples was placed under \$10,000 bail. The Eddy Paper Company has a claim against the Niagara company for \$8,000, the Caseing Company, \$3,237.50, and the Monarch

company \$5,300. All of these claims are for merchandise shipped to the Niagara Company.

The Champion Coated Paper Company, of Hamilton, Ohio, has just received from the Postal Department at Washington the biggest contract ever awarded for postal card paper. The contract calls for a minimum of 6,000,000 pounds of post card paper a year for four years. The total amount of the contract aggregated \$1,110,000. Heretofore the authorities at Washington have been entering into contracts for post card paper each year, but the present administration decided to call for bids for a four year contract and as a result lower bids were received, according to Walter Randall, secretary of the Champion Company, whose company has been furnishing this paper for quite a few years. He also stated that the filling of this contract would keep his company running practically at full capacity for the next four years.

Edward W. Elsworth, who for a number of years was secretary and general manager of the Norwood Paper Company, one of the Remington group of newsprint mills of northern New York, has just been made a director and secretary of the Grapefruit Products Company, Inc., of Watertown, N. Y., and has opened an office at 33 Sherman Building, that City. Mr. Elsworth severed his connections with the Norwood company several months ago, and a few days ago decided to go into an entirely separate line of business.

The last of the criminal prosecutions against the officers of the Baylesso Pulp and Paper Company, of Austin, Pa., growing out of the flood which devastated that village on September 30, 1911, destroying eighty lives, and three millions of dollars in property, were nolle prossed at Coudersport, Pa. on December 10, by Judge John Ormerod. Private prosecutors presented petitions requesting the step on the ground that they believed that there could be no conviction of the accused for voluntary manslaughter under the facts in the case. Settlements of the civil actions for damages against the company opened the way for securing the consent of the private prosecutors to drop the criminal cases.

J. N. MacDonald, manager of the Mac-A-Mac corporation, of Brandreth Lake, N. Y., stated on December 19, that the past summer had been a very prosperous one for his corporation. About 60,000 cords of pulpwood have been cut during the past summer, and it is ready to be drawn to the tracks of the railroad belonging to the corporation as soon as snow sets in. He also said that as soon as the snow is on the ground so that the logs can be drawn on the skidways, that the shipments will begin to the St. Regis Paper Company at Deferiet. It is estimated that it would take a train forty miles long to ship out the entire output. Mr. MacDonald expects that there will be a daily shipment during the winter months of about thirty cars. Last winter about 45,000 cords of

pulp wood were shipped from Brandreth Lake to the St. Regis Company. During the past summer the corporation has extended its railroad about eight miles and now has a mileage of nearly twenty miles. Two engines belonging to the company are used in drawing the timber to the M. & M. branch over which it is shipped to Remsen and then over the St. Lawrence division to Derflets.

The International Paper Company has filed with the Interstate Commerce Commission a complaint against the rates on pulp wood which have been brought into effect on the Canadian Northern, Grand Trunk, Canadian Pacific and their American connections. It is charged the new tariff contains a large number of increased rates from the various points at which pulp wood is produced and shipped in Eastern Canada to points at which wood is manufactured into pulp in New York and other Eastern points. The general result of the new tariffs, it is asserted, is to increase the rates on the pulp wood throughout this territory from one-half to three cents per 100 pounds, averaging approximately 11% over the former rates. The effect of the increased rates, it is said, will be to add to the cost of paper at least 56 cents a ton and restrict the importation of any pulp wood from Canada to mills in New York State. It is charged that three increased rates were established in order to impose indirectly an export tax on Canadian pulp wood and not because the rates formerly in effect were unremunerative or unreasonable. The commission has been asked to fix a reasonable rate on pulpwood.

The mill of the International Paper Company, at South Glen Falls, N.Y., is running full head, better than it has in years, according to one of the officials of the company in an interview this week with your correspondent. The high water is directly responsible for this boom and with the aid of the new power dam, enough has been supplied to put every machine in operation. All of the six machines in the mill are running and an enormous quantity of paper is being turned out daily.

The new 2,368 horsepower plant of the Centralia Pulp & Water Company was started recently at Grand Rapids, Mich., by C. Nason, manager of the company. The ceremony was witnessed by the stockholders and guests. Speeches were made by Mayor Joseph A. Cohen, of Grand Rapids; L. M. Alexander, president of the Nekoosa-Edwards Paper Company, and Howard Weiss, of the forestry of the State university.

Reports so far received regarding logging during the coming winter months in the State of Maine, indicate that the log cut will be very small, if compared with previous corresponding seasons. It is the opinion, however, of those thoroughly familiar with the situation, that this situation will not continue long as many of the large operators and mill owners will have large crews in the woods throughout the season. Many of the contractors already have their crews in the woods, and there was never a time when the Boston and Bangor employment agencies had a larger demand for woodmen. Heavy hardware dealers who sell woods outfits say their business this year exceeds that of former years, and they have been informed that

logging will be carried on during the winter on an exceptionally heavy scale.

The industries of Skowhegan, Me., have been increased by an innovation in the line of paper-making for this part of the State—that is, manufacturing paper from the waste of wool mills, old papers, old rags and many other kinds of waste materials. This business is now carried on by the Savage Manufacturing Company, and twenty-six hands are at present employed in the work. The mill was started by E. L. Savage as a ground wood pulp mill, but the present product makes the mill unique for this section. He is at present making fourteen grades of paper, and contemplates the making of more in the very near future.

The Crystal Paper Company has filed an application for a charter in the State of Ohio, with an increased capital from \$60,000 to \$120,000, and changing its main office from Lima to Middletown. It is proposed by the change to make the preferred stock bear dividends at the rate of 7%. The company has been making steady progress in its manufacturing end for some time. About a year ago it built an additional plant at Amanda, Ohio, in the lower part of the Miami Valley, where the principal mill is located. The new mill was built along the banks of the Miami and Erie Canal. This makes two separate mills under the management and control of the Crystal Company. It is understood that the increase in capital is for the purpose of meeting the payment of bonds now falling due on the plant, and also to make some more improvements in the mill that will increase the efficiency of the plants in the way of adopting more improved machinery.

The Munising Paper Company of Marquette, Mich., is rapidly increasing its stride. Materials and equipment have just been ordered and contracts let for extensive improvements in the plant, work on which will begin about the first of January. There will be installed in the power plant, a 400-kilowatt generator, driven by a 650-H.P. engine. At present the plant has two 750-H.P. engines and generators, in addition to which it is supplied with 300 and 750-H.P. from Au Train River power plant, varying with the volume of water in the river. Super heaters to be installed in the south battery of four boilers will convert saturated steam into dry steam for the digestors for cooking pulp, resulting in shortening the time of that operation, a saving of chemicals and the production of a better grade of pulp. In the paper mill vacuum pumps and valves will be installed in connection with the heating and drying systems. The whole machine room ventilation system will be modified, and numerous other improvements made.

The Hon. L. Taschereau, Minister of Public Works in the Quebec Government, has introduced a Bill respecting the toll to be charged for the logs and timber floated down rivers and water courses. It is proposed to give powers to the Running Waters Commission, of which Hon. S. N. Parent is chairman, to fix the amount of the tolls. On the first reading, Mr. Telier suggested that the lumber companies should be held responsible for floods or damage caused by the breaking of dams, and Mr. Taschereau promised to consider the suggestion.

PULP AND PAPER NEWS

The Southam Press of Montreal, who, as reported in our last issue, are building a ten-story extension to their premises in that city, will have the same completed during February and will use most of the extension for high class office space.

The new mill of the Alberta Saskatchewan Straw Products Company at Moose Jaw, Alta., is practically near completion and will soon commence operation. They will use flax straw to manufacture board and building paper.

Extensive alterations are being made in the new Price Brothers mills at Kenogami on account of the original designs not meeting the conditions. They are at present adding two more boilers with dutch ovens to take charge of the waste from the wood room as it has been found that the original design using Murphy stokers which mixed the waste and coal was not satisfactory. A great many other alterations are being made throughout different parts of the plant.

The big lumber case of the Northern Crown Bank and the Great West Lumber Company, Limited of Calgary, was concluded last week and will go before the Privy Council. This has been a most expensive litigation and a great deal of money has been spent on both sides.

"There is no truth in the story about the pulp and paper mills merger as far as we are concerned," declared Mr. M. J. Seaton, vice-president of the Powell River Company, at Vancouver, on the 11th inst. "We are very satisfied with the prospects of our enterprise," he continued, "and we have no intention of disposing of it. You can make that as emphatic as you like. We have just completed a big addition to our plant at Powell River which almost doubles the output and we have orders for a long time ahead."

The Cannon Lake Lumber Company, Ltd., has been incorporated with head office at Winnipeg, Man., and capital stock of \$100,000. The incorporators include P. P. Elliott, Fort Frances; W. L. McIntosh, A. C. Miller and B. C. Deacon, all of Winnipeg. The rights of the company include the carrying on of logging and lumber manufacturing business in all its branches and the manufacture and sale of pulp and articles manufactured from pulp. The new company has, it is stated, taken over all Mr. P. P. Elliott's timber business in that district and will carry on the timber and tie business the same as conducted hitherto by Mr. Elliott.

Thomas Gibson, of Toronto, who is secretary of the Lake Superior Corporation, has been elected a director of the Spanish River Pulp and Paper Mills, replacing J. Frater Taylor, of Sault Ste. Marie, who resigned a few weeks ago owing to pressure of other duties. The accounting department of the Spanish River Company, has been removed from Toronto to Sault Ste. Marie, to the offices of the Lake Superior Paper Company, under the direction of Lionel Lumb, comptroller of the company. The cost branches in connection with the mills at Espanola, Sturgeon Falls and Sault Ste. Marie,

are now conducted at each of these places. The executive and sales offices remain in Toronto. Joseph Krockenberg, who for some months has been superintendent of the Espanola branch of the Spanish River Pulp and Paper Company, under Joseph Slater, general superintendent, has resigned to accept the position of superintendent of the new news-print mill of the Donnacona Paper Company at Donnacona, Quebec, which will be in operation in a few weeks. Previous to joining the Spanish River, Mr. Krockenberg was night boss under John J. Ross, Superintendent of the plant of the Minnesota and Ontario Power Company, at International Falls, Minn. He has extended experience and is well qualified for his new post.

The Interlake Tissue Mills, of Merriton, Ont., are now manufacturing sanitary crepe table cloths for use at church festivals, cafes, banquets, etc. The standard size is 52x72 inches and already there is a good demand for this line. The company report that the sale of crepe napkins and sanitary crepe towels is rapidly increasing.

The new board mill of the Hinde and Dauch Paper Company of Canada, has begun operations in Toronto and the new machine is working smoothly. O. H. Moore, manager of the company, is well pleased with the quality of board that is being turned out. The capacity of the plant is forty tons per day and all kinds of box board will be made, including fute and chip board from old papers and sulphite. J. J. Dauch, President, and Sydney Froham, secretary of the company, came over from Sandusky, Ohio., a few days ago to witness the inaugural ceremonies. The new building is 264 feet long and 60 wide, four stories high, and constructed of brick, cement and steel. The structure is well lighted and admirably appointed. The new machine, which was built by the Downington Manufacturing Co., of East Downington, Pa., is 124 inches wide, it is equipped with four cylinders, three sets of press rolls and one Millspaugh suction press. There are six beaters of 1200 pounds capacity furnished by the Waterloo Co., of Brantford, and four Jordans from the Noble & Wood Machine Company., of Hoo-sick Falls, N.Y. The three upper floors of the new addition are used for the manufacture of corrugated paper boxes and the capacity of this portion of the plant will be more than doubled. George Brown late night superintendent of the board mill of J. R. Booth at Ottawa, has been appointed superintendent of the Hinde and Dauch board mill and has entered upon his duties.

John R. Barber, the veteran paper manufacturer, who has been in rather poor health for some months is now at his home in Georgetown and able to be about every day and attend to private business.

E. R. Colbert, formerly superintendent of the coating mill of the Georgetown Division of the St. Lawrence Paper Mills who resigned some time ago, is devoting his attention to the new mill which is being erected by Gummed Papers, Limited,

in Brampton, in which he is a leading shareholder along with Capt. R. R. Barber. It is expected that the new industry will be under way in a few weeks. Roy Kercher is now in charge of the coating mill at Georgetown, having been assistant to Mr. Colbert for some time.

J. L. McNicol, of Toronto, left this week for Millerton, N.B., where he has been appointed manager of the New Brunswick Pulp and Paper Company's plant. It is understood that James Beveridge is retiring. Mr. McNicol is a thoroughly experienced paper-maker in all branches of the trade, and previous to coming to Canada eight years ago, was employed in some of the leading mills in Scotland and England. He also spent fourteen years in India. He was in charge of the Mille Roche Mill for some time and later the Montrose plant at Thorold. For four years he was with William Barber and Brothers, at Georgetown, three years in charge of the Barber mill and for one year superintendent of the coating plant, retiring some eight years ago, after which he spent several weeks on a visit to his old home in Scotland. For the past few months he has been associated with A. M. Huestis, of Toronto, representing several Old Country and American mills making special lines of paper.

George Coates, the employee of the Lincoln Paper Mills who lost both arms by having them drawn into a stack of calenders at Merritton some time ago, has returned to Toronto. The unfortunate man was presented, as already stated in these columns, with a purse of twenty-seven hundred dollars by the residents of St. Catharines and Merritton. Coates, who is a former member of the Toronto Street Railway Men's Union, received a further gift last week of three hundred dollars from his associates on the road.

The Toronto Paper Manufacturing Company, whose mills are located at Cornwall, have reduced the dividend on the stock from an eight to a six per cent. basis. It will be remembered that some months ago the dividend was suddenly raised from six to eight per cent. The reason given by the directors for the present reduction is the unsettled condition of trade in general and the fact that a more conservative policy is the better one to pursue until the market for book and writing paper improves. The company is now turning out loft-dried ledger and bond papers of a very fine quality and the overhauled sulphite plant is giving one third increased capacity. Garnet P. Grant of Toronto, has resigned from the Board of Directors but the vacancy has not yet been filled.

The E. N. Burt Company, of Toronto, have declared their regular dividend of $1\frac{1}{4}\%$ on the preferred stock and $1\frac{1}{4}\%$ on the common. The Pacific-Burt Company, of Toronto, have declared a quarterly dividend of $1\frac{1}{4}\%$ on the preferred and $1\frac{1}{4}\%$ on the common. The Laurentide Paper Company, have declared their regular quarterly dividend of $2\frac{1}{2}\%$. Smart-Woods, Limited, have declared a quarterly dividend of $1\frac{1}{4}\%$ on the preferred and $1\frac{1}{4}\%$ on the common stock.

M. Ivan Bunge of Paris, France, was in Toronto last week on his way to Owen Sound, where he bought a large quantity of wood for the firm of Bunge Brothers, of Harve, importers of white birch, soft pine, and maple.


I. H. Weldon, President of the St. Lawrence Paper Mills, Toronto has returned from a visit to Indianapolis, Indiana. He and his brother T. A.

Weldon of Thorold, manager of the Montrose Division, spent New Years with their father at St. Thomas, Ontario, who although in his ninety-second year, is still hale and hearty.

Mr. Whyte, manager of the Abitibi Pulp & Paper Company, at Iroquois Falls is optimistic that all the plant will be installed in the mill by April. It will then be a matter of a few weeks until it is running. The wet machinery and wood room builders have been covered in and the men engaged in construction are now working in comparative comfort. The machinery will begin to arrive in January and the skilled mechanics who will be imported will at once commence to put it in. For their comfort and that of the staff an hotel with thirty bedrooms has been completed. It will be equipped with all modern conveniences. The clearing off of the townsite where houses will be built for the married employees has commenced. Pulp wood has been taken off for a mile strip three-quarters of a mile west of the mill. The deforestation is being done scientifically so that sufficiently young trees are being left to form a wind break. There are all told now in the bush 250 men cutting pulpwood for the company. Two of the many parties are cutting near the mill and two more between Iroquois' Falls and Matheson along the Black River; the remainder are using Abitibi Lake as the seat of their operations.

Messrs. McCrea and Tobin of the Brompton Pulp & Paper Company, this week sold the property of the Chaudiere Lumber Company, of which they were the individual owners, to Jean Breakey, of Quebec. The property consists of about 15,000 acres of timber lands, one-third of which the company owned in fee simple, and two-thirds the cuts of timber only, also the improvements at Chaudiere. The price is understood to have been about \$350,000. In addition, the purchasers take over all contracts for wood to be cut this winter, re-implementing Messrs. McCrea and Tobin for advances made and expenses. The Chaudiere Lumber Company was organized about seven years ago for handling pulpwood and ties. It originally consisted of several shareholders, but recently Messrs. McCrea and Tobin have been the sole owners.

Mr. Charles Ponsonby of the Canadian Agency, Limited, has returned to England after a visit of inspection to the various enterprises in which his company is financially interested. Up to the present time the management of the Spanish River Company have had difficulties to contend with, and the company has only recently come out of the construction stage; in fact, during last year its production was only at the rate of 35,000 tons per annum, whereas the output which is now expected is about 64,000 tons. In addition, the company suffered in the fall in the price of the commodity, owing to several new mills coming into the market during the past two years. "I satisfied myself that the over-production which has affected the paper companies during the past year or two, has now been practically absorbed and it is reasonable to suppose that the price of the commodity will gradually rise. This will be a great benefit to all paper companies. The alliance recently formed between the Spanish River Company and the Lake Superior Paper Company at Sault Ste. Marie, should be to the advantage of both companies, not only in eliminating all competition in that district of Ontario, but in the reduction in operating expenses."



The Markets

CANADIAN MARKETS.

There is a good demand for news and all the mills report that the usage of print paper during the past month has been exceptionally heavy owing to the large editions of the daily papers and special holiday numbers. Prices are firm and it is generally agreed that during the present stringency, the news mills have come out the best owing to the steady and increasing demand for their product. Book and writing plants are only fairly well employed and business has not picked up to the extent that it was hoped it would. However, better things are expected after the holidays. Contracts from several large departmental stores, who issue their spring catalogues at this season of the year, have helped out matters in the book and coated paper lines somewhat. The wrapping paper situation appears about the same and the mills are industriously looking for orders. One noticeable feature about the demand for papers used in Christmas trade was the increased usage of glazed kraft, which seems to be replacing fibres and manilas to some extent. There is a fair demand for ground wood and prices are holding very well. In sulphite the situation is a little easier and quotations since the United States embargo has been removed from the foreign product are lower than they were at this time last year, by two or three dollars. In the rag and paper stock market, mixed papers are a little easier and there will not be much business doing until after the holidays. Several paper jobbing houses are busy taking stock at the present time. The annual meetings of many paper houses and mills will be held during the coming month and some concerns will show an increase in volume over 1912 while others report a slight falling off. On the whole, the paper trade has not suffered as severely as some lines of business and the year just closed, considering the augmented tonnage in all brands and the tightness of the money market, has been fairly satisfactory. Quotations f.o.b. Toronto to consumers are as follows:

Paper

News rolls, \$42 to \$44, delivered.
 News (sheet) \$46 to \$50, f.o.b., mill
 Book papers (carload) No. 3, \$3.75 to \$4.50
 Book paper (ton lots) No. 3, 4c. to 4.50
 Book paper (carload) No. 2, 4.25c.
 Book paper (tons lots) No. 2, 4.50c. to 5c.
 Book papers (carload) No. 1, 4.75c. to 5.25c.
 Book papers (ton lots) No. 1, 5.25c. to 5.75c.
 Writings, 5c. to 7½c.
 Sulphite Bond, 6½c. to 8½c.
 Fibre, \$3.00 to \$3.75
 Manila B., \$2.50 to \$3.25
 Manila No. 2, \$2.75 to \$3.50
 Manila No. 1, \$3.25 to \$4.00
 Unglazed Kraft, 3.75 to 4.50
 Glazed Kraft, \$4.25 to \$5.00

Pulp

Ground wood (at mill), \$15 to \$16
 Ground wood, \$22 to \$24.50, delivered in United States

Sulphite (unbleached), \$43 to \$45, delivered in Canada
 Sulphite (unbleached), \$43 to \$46, delivered in United States
 Sulphite (bleached), \$58 to \$60, delivered in Canada
 Sulphite (bleached), \$58 to \$62, delivered in United States

Paper Stock

No. 1 hard shavings, \$1.90
 No. 1 soft white shavings, \$1.72½
 No. 1 Mixed shavings, 55c.
 White blanks, 85c. to 87½c.
 Ordinary ledger stock, \$1.20
 Heavy ledger stock, \$1.40 to \$1.50
 No. 1 book stock, 72½c. to 75c.
 No. 2 book stock, 50c. to 55c.
 No. 1 manilla envelope cuttings, \$1.15
 No. 1 print manillas, 65c. to 67½c.
 Folded news, 55c.
 Over issues, 57½c.
 No. 1 clean mixed paper, 37½c. to 40c.
 Old white cotton, \$2.50 to \$2.75
 Threds and blues, \$1.30 to \$1.32½
 No. 1 white shirt cuttings, \$5.25 to 5.50
 Blue overall cuttings, \$3.50 to \$3.62½c.
 Black overall cuttings, \$1.75
 Black linings, \$1.75
 New light flannelettes, \$4.60 to \$4.75
 Ordinary satinets, 75c.
 Flock, 90c.
 Tailor rags, 65c. to 67½c.

THE BRITISH MARKETS.

Special to the Pulp and Paper Magazine.

London, December 20th, 1913.

The present state of the paper industry in the United Kingdom does not show any improvement compared with my last report. Some of the mills are in a bad way for orders, particularly for news-print, and of course, this state of affairs is bound sooner or later to materially affect the consumption of woodpulp. The exports of paper and millboard and playing cards, etc., only reached 269,854 cwt., compared with 337,466 cwt. in November, 1912, the figures for the eleven months being 3,039,901 cwt. in 1912 and 3,241,082 cwt. Paper mills in the North of England are complaining the most about the slackness of new business. There is a fair consumption of fine printings, writings, etc., in the large publishing houses where a fair amount of work given out by the government departments and municipal bodies (which entails a large consumption of paper), is being rushed. The book-binders strike is still unsettled and the Irish consumption of paper lately has been very limited.

The Income Tax Commissioners and their department are hearing some severe attacks made on them over the class of paper they introduce. "Londoner," writing in one of Lord Northcliffe's

papers says: "For one thing I should suggest a change of stationery. The Income Tax can not change his stationer, who is probably the Stationery Department. But I can assure my friend the Income Tax, that under pressure, even the Stationery Department can provide better stuff than this crumpled sheet of buff paper. . . ."

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The market conditions for sulphite and sulphate is continuing inactive and quotations are on a high level. Complaints are also heard here from Germany and Scandinavia of the inactivity of the pulp markets in those centres. Prices about are as follows, c.i.f. British ports:

Bleached Sulphite.....	\$52.80 to \$57.60
Easy Bleaching Sulphite 1st quality.	40.80 to 47.00
Sulphite News.....	36.20 to 39.40
Unbleached Soda, 1st quality.....	39.40 to 40.20
Unbleached Soda, strong.....	36.00 to 39.40
Soda Kraft.....	38.40 to 39.40

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Buyers are adopting a waiting policy and very little new business is reported. There is also rumors that it is difficult to agree on a price for 1914. Prices are about as follows, c.i.f. British ports:

Pine 50% moist (prompt).....	\$9.90 to \$11.00
Pine dry (prompt).....	20.20 to 21.00

For forward delivery add another half dollar.

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The Esparto trade is experiencing pressure for temporary supplies of prompt shipments and prices have gone to a higher level. The rag, bagging, gunny and wastepaper trades are all busy and lately the run on stocks have been heavy.

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The chemical trade has been experiencing a dullness recently, but prices have changed very little, except for Bleaching Powder which is now quoted \$26 to \$27. Sizing is also unchanged and rosin is cheaper and quieter. The china clay trade keeps busy and the demand is good. During November 60,402 tons were exported as compared with 43,872 tons in November, 1912.

NEW YORK MARKETS.

Special to the Pulp and Paper Magazine.

New York, N.Y., December 23rd, 1913.

Comparatively little new business has developed during the interval in either foreign or domestic sulphites. This is due partly to the concluding of business in all lines for the year 1913. Consumers of chemical pulps in all quarters are now preparing for the new year, and in consequence of the same old year-end quietness prevails, and the delivering of old orders, or the recording of small additional sales, chiefly in krafts and unbleached sulphites, to complete the year's needs provided about the only stir noticeable. Though prices have been rather easy during the past two months, they are now repeating a more steady tone, and it is the consensus of opinion among the leading distributors that after the turn of the year, trading on all sides will assume a larger and better volume. In summing up the year's business one of the leading local distributors stated this week that he feared the record for 1913 would be considerably below either 1912 or 1911.

This being the last week of the old year, it was but natural that the call for additional lots of

ground wood pulp should be extremely light. The closing of the year has not entirely augmented this situation, however, for mills during the past several months have had a plentiful supply of pulp on hand, and, on account of the very good water conditions were enabled to grind considerable more pulp than needed. But, conditions are now changing. Many of the mills are suffering from anchor ice troubles, and in consequence only about 80 per cent. of the actual capacity of the grinders is being turned out. Values are fairly steady, and f.o.b. prices given herewith are a good criterion of the market situation.

The temporary cessation of operations among the mills generally during the week for stock taking and other purposes, has been quite noticeable in the local paper stock field. However, some few dealers report bookings of good sized orders to Western manufacturers for hard and soft white shavings, book and ledger stocks. Common papers are accumulating rapidly as consumers appear to have sufficient supplies in hand to cover requirements for sometime ahead. Nevertheless good packings of mixed are commanding a little attention at around 35c., while commons rule at 25c. per 100 pounds. Shavings are firm at 2c. to 2½c. for hard and 1½c. to 2c. for soft. White news is selling at 1½c. ledger at 1½c., solid ledger at 1½c., and book stocks ¾c. to 1½c.

Pulp.

Ground Wood, No. 1, \$17 to \$19 per ton, f.o.b. mill
Ground Wood, No. 2, \$15 to \$16 per ton, f.o.b. mill
Unbleached sulphite, domestic, 20.05c. to 2.20c. per lb., delivered.
Unbleached sulphite, imported, 1¾c. to 2c. ex dock, New York.
Bleached sulphite, domestic, 2.90c. to 3c. per lb., delivered.
Bleached sulphite, imported, 2.70c. to 2.95c. per lb., ex dock, New York.
Easy bleaching sulphite, imported, 2.10c. to 2.20c. per lb., ex dock, New York.
Unbleached sulphite, imported, 1.80c. to 2.10c. per lb. ex dock, New York.
Bleached sulphate, imported, 2.60c. to 2.80c. per lb., ex dock, New York.
Kraft pulp, imported, 1.85c. to 1.95c. per lb., ex dock, New York.
Soda pulp, domestic, 2.15c. to 2¼c. per lb., delivered
(All quotations of foreign products are made on a basis of ex duty.)

All trade activity in the New York market, has now given way to the quieting influences incident to the holiday season. Such business as developed during the past week represent chiefly orders that were placed for filling in purposes until the year closes. Because of the curtailed demand, dealers are busily engaged putting their affairs into shape to take stock and conclude the yearly balancing of their accounts. The jobbers say their customers only want such goods as will carry them over the remaining days of 1913, and can not be induced to buy over next year. Retail houses have been quite busy for the holidays, but this trade reached its height this week and quietness on all sides is now most pronounced. Though there are some optimists in the paper trade, it is a conceded fact that every one interested therein has greatly suffered under the general depression of business. Paper manufacturers in many quarters have either been forced to shut down completely or else greatly

curtail operations. Of course, there are a few who are enjoying good business but the balance sheets of the majority will not be so glowing in 1913 as they were at the close of 1912. Retailers have bought cautiously all during the year. This in turn caused the jobbers to buy in a similar way, and in consequence the mills have not the volume of futures on their books that they have had in previous years. Notwithstanding all of this, prices in all lines have ruled very firm all during the year, and values today, with the bare exceptions of newsprint and tissues, are pretty much the same as they were on January 1st last. Newsprint has suffered considerably under the influences of competition incident to Treasury decision admitting other countries to the same privileges extended to Canada under the reciprocity agreement, and also the new tariff matter. This has caused a slight depression in prices during the year, and values now are somewhat lower than they were when they year opened. The situation in tissues has been somewhat different and quotations are much firmer. Previous range of prices are without change and are repeated as follows:

News, rolls, transient business \$1.95 to \$2.00 f.o.b. mill.

News, sheet, \$2.10 to \$2.15 f.o.b. mill.

Book papers, car lots, C. & S.S., \$4 to \$4.20 f.o.b. mill.

Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b. mill.

Writing paper, superfine, 11c. to 13c. del. east of Miss. River.

Writing paper, extra fine, 10½c., del. east of Miss. River.

Writing paper, No. 1, fine, 9c., del. east of Miss. River.

Writing paper, No. 2, fine, 8c. del. east of Miss. Riv.

Writing paper, engine sized, 1½c. to 8c. del. east of Miss. River.

NORWAY AND SWEDEN.

Mr. C. E. Sontum, Trade Commissioner at Christiania, Norway, reports as follows, under date of Dec. 3, 1913.

The Norwegian Pulp Market.

In a report of November 3, it was stated that on account of the dry summer and fall, the water in the Norwegian rivers had become so low that several pulp mills had partly to close down for want of power. During the month of November the weather has kept very mild and a good deal of rain has come, which will help out the mills in the lowland districts to a large extent. There is with them at present no shortage of water. In the inland districts, however, where there has been snow instead of rain, the rivers are still sinking, and the mills are most all being run with reduced power.

The Norwegian makers of mechanical wood pulp hoped that the prolonged drought would cause a restriction of output sufficient to give some firmness to their depressed market. When most mills were obliged last month to stand idle or work with greatly reduced power, the prices actually commenced to harden, but since the prospects for sufficient power during the winter have been improved, the market has again relapsed into the same dull and lifeless condition as previously.

Cellulose is inactive and the tone is not strong. **Imports into Norway of Russian pulp wood.**

During 1912 there was in the neighborhood of 30,000 English cubic cords of pulp wood imported from St. Petersburg. During 1913 the same import is estimated at 35,000 such cords. This import the Norwegian mills so far have found paying on account of the lower prices at which the Russian raw material could be bought. However, the prices have lately been raised, so it is doubtful how long this import will be found to pay. The demand for a higher price by the Russian exporters is principally caused by the increase in the wages in the inland of Russia during late years. This increase has amounted to as much as 50 per cent.

From St. Petersburg three kinds of pulp wood are exported, viz., clean-barked spruce, half-barked spruce and clean-barked aspen wood, besides a comparatively small quantity of half-barked aspen wood. The prices during 1913 have been for clean-barked spruce from Rbl. (Russian rubles) 44.00-46.40 pr. Russian cord of 343 cubic feet, for half-barked spruce from Rbl. 40.00-44.00 and for clean-barked aspen from Rbl. 28.00-32.50.

Export of Paper from Norway.

The export of paper from Norway was in 1908 108,000 tons; in 1910, 138,000 tons; and in 1912, 150,000 tons, and thus is steadily increasing.

Swedish Mechanical Pulp.

As usual, the water conditions decide upon the tendency of the market for mechanical pulp, and the rains, which we have had during the last days, have in some degree stopped the rising tendency, but only to a very small extent. We have just been informed that one of the largest buyers is offering Kr. 23.00-28.88 clear net f.o.b., Baltic port without finding sellers at this price. As we have not yet been able to get this statement verified, we must give it with reservation.

Swedish Chemical Pulp.

We are informed from the United States that several speculating importers are strongly endeavoring to press the market by circulating the customary untrue rumors about large stocks at the mills in Scandinavia as well as in the docks at the import harbors. The Swedish Cellulose Union declared officially some time ago that the stocks at the mills were small and comparatively the same as at the same time last year, and an examination, which the agents of the steamship lines have made, has showed that the stocks in the docks at the import harbors are only about 6,000 to 7,000 tons, or about a week's normal import.

It is also stated that several speculating importers have occasionally given out cheap offers for small parcels with a view to make buyers still more nervous.

However, we have also got a look at a report from a very esteemed and reliable firm of agents at New York, which is stating that the United States paper mills have in many cases not filled their requirements for next year. This firm pronounces the opinion, that they have not filled more than about one-fourth of their requirements, and if the Scandinavian manufacturers of chemical pulp would only hold well together the market would soon be equally favorable as in 1912, as the United States paper mills will very soon be obliged to enter the market in earnest.

Paper and Wood-Pulp Industry of Sweden.

In the year 1911 12,776 workmen were employed in the different mechanical and chemical pulp mills of Sweden. The power employed at the same time was 156,967 h.p. The paper and paste-board mills employed 12,482 working men and the power was 56,648 h.p. The 213,000 h.p. thus employed in these two industries stands as No. 1 of Swedish power employed in any industry and is principally obtained through water power.

The Swedish Pulp Prices.

The latest Swedish quotations for pulp are:—

Mechanical, moist, white.....	\$ 8 67 to \$ 9 33
Mechanical, dry, white.....	19 73 to 20 80
Sulphite, prime, light bleached.....	40 00 to 40 80
Sulphite, prime, strong.....	36 00 to 36 80
Sulphate, light bleached, ordinary.....	36 00 to 37 33
Sulphate, strong.....	36 00 to 38 67
All per ton f.o.b. steamer Swedish ports.	

AUSTRALIAN IMPORTS.

Aggregating the imports of paper of all kinds—including printing, wall and wrapping paper—paper boards, printed books, stationery and stationers' sundries, the extent and growth of the importations into the Commonwealth are reflected in the following figures:—

	1911	1912	1912 Increase
	£	£	£
Total imports.....	2,831,808	3,116,215	284,407

Eliminating the item of printed paper, which is dealt with under a special heading, the other lines of paper, boards, etc., imported from Canada in

Imports from Canada	1911	1912	1912 Decrease
	£	£	£
Paper boards coated.....	5	—	5
Paper advertising.....	176	636+	460
Paper millboard, etc.....	971	545—	426
Paper wall.....	1,546	3,051+	1,505
Paper wrapping.....	206	—	206
Paper other free.....	8,201	2,068—	6,133
Paper n.e.i., boards, etc.....	—	308+	308
Paper books, etc.....	297	22—	275

With the exception of wall paper, advertising matter and one line of boards, the 1911 values were not maintained by Canada in 1912, but as regards some items, there promises to be an improvement in the 1913 figures. The attention of interested Canadian manufacturers is directed the detailed schedules appended to this report, which gave particulars of Australian imports of paper from all countries during 1911 and 1912.

The Commonwealth Requirements of Printing Paper.

Second in value (coming next to agricultural machinery and implements) in Canadian exports to Australia is the item of paper, of which practically the whole is printer (news) paper. The total imports of printing paper into the Commonwealth in 1912 were valued at £906,431, which represented an increase of \$180,016 over 1911 and also constituted record figures. The increase in the value of the imports from Canada was £15,970, but the total of £179,173 in 1912 compares with

£189,791 in 1908, which demonstrates that despite increased production in the Dominion, other paper-producing countries, are obtaining a stronger hold on the Australian market. Taking Norway and Sweden, conjointly, their exports of printing paper to Australia increased from £120,444 in 1911 to £179,327 in 1912, representing a gain of £58,883 of which practically the whole was newspaper. Obviously, the total increase of imports is not attributable to newspaper—on reels and flat—as other printing paper, which Canada does not specialize in, is included in the same classification. Machine finished printing paper and highly finished (on one side) lithographic papers are responsible for much of the imports from the United Kingdom, and to a lesser extent from the continent and the United States. Printing paper is not made in Australia and is admitted duty free, hence competition from oversea is upon the same basis, but continental shippers may possibly obtain lower freight rates than Canadian exporters.

The trend of the trade in recent years is disclosed in the comparative statement appended, showing country of origin and values:—

Imports of Printing Paper	1910	1911	1912
	£	£	£
United Kingdom.....	303,541	303,660	329,908
Canada.....	158,624	133,203	179,173
Austria-Hungary.....	8,320	5,335	8,059
Belgium.....	10,498	8,054	9,197
France.....	23	—	—
Germany.....	33,866	44,203	44,723
Netherlands.....	765	1,307	4,672
Norway.....	58,049	69,260	74,396
Spain.....	133	301	—
Sweden.....	46,285	51,184	104,931
United States.....	111,038	106,611	151,115
Other foreign countries..	54	77	141
India.....	—	236	—
Straits Settlements.....	—	14	—
New Zealand.....	—	—	113
Japan.....	—	—	3
Total.....	731,196	726,415	906,431

Australian Paper Mills.

In New South Wales (near Sydney) there are two paper mills now in operation, one making wrapping paper and the other making manilla and box board (including strawboard). A third mill is being established in New South Wales for the purpose of making paper boards of varied character from waste paper and imported wood pulp. In making strawboard (from local material) and other boards from waste paper. There are also two mills in Victoria making wrapping paper, and one of these has additional plant manufacturing cartridge and blotting papers. The present output of Australian mills is not large, but the industry is making steady progress. No statistical information is available respecting the value of the output and paper and board mills in the Commonwealth. In 1912, wood pulp to the limited value of £662 was imported from Europe.

G. T. Clarkson, assignee of the Northern Island Pulp Wood Company, Ltd., Port Arthur, is offering for sale all the assets of their company comprising 13,000 acres in the district of Thunder Bay, containing 125,000 cords of wood together with the rights to cut over about 70,000 acres more. The day of sale is called for Wednesday, 18th March.

British Trade News

(Special to the Pulp and Paper Magazine.)

London, December 15th, 1913.

Indian papers that have reached London, show that the prospects of paper-making are being talked about at Bombay and Ceylon. The question is asked by one newspaper: "Why is there not a flourishing pulp and paper-making industry in India?" It states that while thousands of tons of paper are imported into the country every year, the Indian forests abound in materials suitable for paper-making, although according to general opinion, the raw material is not available. Special investigations, however, have shown that this apprehension is unfounded. Mr. W. Raitt, F.C.S., of the Imperial Forest Research Institute and cellulose expert to the Indian Government, shows that pulp can be produced from Savannah grasses. In one of his recent reports he explains that undelached pulp can be produced from these grasses in Indian paper mills for less than \$48, or, in some instances, \$53 per ton. Compared with the cost of pulp of European manufacture, this leaves a margin of estimated cost of from \$10 to \$14 available for manufacturers' profits and payment of freight to customers. Mr. Raitt's investigation of these grasses, therefore, amounts to a proof of the prospective economic value of large tracts of land hitherto considered unproductive and an addition to the paper and pulp making resources of the country of a supply of raw material, which, it is stated on a most considerable estimate, can not be less than several millions annually. The "Times of India," and the "Journal of the Society of Arts" in London, say these facts are worthy the attention of papermakers in the British Isles, particularly those who do a large trade with India.

Mr. G. W. Osborn, who presided at the annual meeting of Wall Paper Manufacturers, Ltd., said the past year had been a very trying time for a manufacturing business of their kind. The tendency had been for nearly all their raw materials to advance in price, and the costs of fuel and manufacture had all been on the up grade. Where the article manufactured was a fancy one, such as wall-paper, many buyers had a tendency not to pay higher prices than had been their custom on previous occasions while they were anxious to obtain an equal, if not superior, effect in their decorations. In other words those who had been accustomed to buy a 60-cent paper, wanted a 60-cent paper again in a market where the cost of production was rising. They had either to put less into the article or the extra cost of raw material and manufacture had to come out of the profits. As to the prospects, there was some indication of a stirring in the building trade, which for two or three years had not been brisk. This was likely to have a good effect on wall paper.

The Carron Grove Paper Company in its annual report for the year ended October 25, states that after maintaining the mill and machinery in thorough efficiency, and writing off the charge for depreciation, the net profit for the twelve months

reaches £18,330 and the balance brought forward is £4,173, making £22,503. The directors propose to carry to reserve £7,550 and to pay a dividend on the ordinary shares at the rate of 10% per annum. The Darwen Paper Mill Company, Ltd., report for the half-year, states that after allowing a sum amounting to £9,250 for interest and depreciation, there is a net profit of £1,255. The adverse balance in the profit and loss account is now reduced to £1,195. The directors also state that the newsprint trade still continues most unsatisfactory. This observation of the directors is a general summing up of the newsprint trade position not only in England, but in Germany and Scandinavia. There has been quite a lull in business and some of the Lancashire mills are feeling the dullness of trade just as much as those in the south of England. In Dublin, where the labor riots have occurred recently, the paper mills are closed for want of coal and raw materials. A large amount of mill-board and pulp-board is shipped from Canada to Dublin each year. The paper-makers of Germany held a meeting recently and it was decided to limit the production of German paper mills in the months to come in order to put the output more on a level with the consumption and thus keep up prices.

Speaking at the annual meeting of the Kellner-Partington Paper Pulp Company, Sir Edward Partington said he would deal with the item, "Investments and forest properties," which appeared in the balance-sheet at £1,142,982. It was, he said, a large sum in comparison with the capital of the company. For some years it had been the policy of the directors to secure control of the supplies of raw material the company required for manufacturing purposes. For the last three or four years they had been doing that on a large scale. The company was a large consumer of wood and the directors thought it advisable, as far as they could, to purchase the land on which the timber grew and to escape the possibility of an artificial inflation of the price. They could not expect to get the same profit from an investment in land as from an investment in manufactures, but, taking it together, the investment was a very good one. A shareholder then asked whether sufficient allowance had been made for depreciation of the forests in Norway and in Austria, and a reply was given that a careful calculation had been made, allowing on the one hand for depreciation in consequence of the cutting down of timber and for appreciation from the natural growths of forests during the twelve months.

The imports of paper into the United Kingdom gives an idea of what the state of trade was in November. These imports which include paper on reels and paper not on reels, hangings, packings and wrappings, cardboard, etc., total:

	November, 1913	
	Cwts	Values
Imports: November.....	977,186	£614,618
Eleven months.....	11,793,942	7,026,346
	November, 1912	
	Cwts.	Values
Imports: November.....	1,014,105	£610,638
Eleven months.....	11,977,391	6,567,832

The export trade of the United Kingdom, which also includes writing and printing paper, mill-board, etc., was as follows in November:

	November, 1913	
	Cwts.	Values
Exports: November.....	269,854	£291,834
Eleven months.....	3,241,082	3,391,004
	November, 1912	
	Cwts.	Values
Exports: November.....	337,466	£331,283
Eleven months.....	3,039,901	3,260,795

It is quite evident that bad trade has not only been experienced on the continent, but in all paper producing countries in Europe including England.

Turning to the imports of papermaking materials we find the following figures:

	Nov. 1913	Nov. 1912
	tons	tons
Mechanical, wet.....	39,503	52,374
Mechanical, dry.....	503	1,535
Bleached chemical, dry...	1,830	2,952
Unbleached chemical, dry.	35,308	39,178
Chemical, wet.....	1,876	1,462

Total of mechanical pulp, 40,006 tons in November, 1913 and 512,989 tons for the eleven months ending November, compared with 453,077 tons ending November, 1912. Other pulp reaches 79,020 tons in November and 868,938 tons for the eleven months ending November, compared with 816,710 tons during the first eleven months in 1912.

TRENT VALLEY FOREST RESERVE

The Commission of Conservation is recommending that the 2,000 square miles of land in the Trent Canal watershed be set aside by either the Dominion or Provincial Governments as a forest reserve. Such a protective measure would under the peculiar circumstances, seem to be well advised. The water supply for the Trent Canal and Kawartha Lakes is obtained from the watershed mainly, and would be seriously impaired if the area in question were denuded of the remaining timber. Since the Dominion Government in 1905 obtained control of the water rights, much valuable work in damming up the back lakes has been done, with the result that the flow of water for power purposes north of Peterborough has enlarged most satisfactorily. The Dominion has spent over ten millions already on the Trent Canal, and by the time the extensions to Georgian Bay and Lake Ontario are completed it will have spent several millions more. And, further there are cogent reasons beyond the water-conservation interest to support the commission's recommendation. Half of the area is now unpatented, or in possession of the Crown. Only a tenth of the land can be farmed, and the farming at the best is so poor as to be quite unprofitable. Less than 700 acres of a million acres of forest is unpatented virgin area. Under the provincial order in Council of 1905, conveying to the Dominion the water control, the right to buy land along the lakes and water courses at 50 cents an acre was granted the Dominion Government, but only two thousand acres were bought. It seems obvious that the best interests of the district, as well as the requirements of a sane conservation policy, would be served by reserving the area in question a reserve for afforestation purposes.

INVESTIGATIONS ON THE PERCENTAGE OF TANNING SUBSTANCE IN SULPHITE WASTE LYE.

Formerly substances were employed for tanning whose effective constituent consisted of co-called tannic acids. Substances which have recently been used for tanning and which, considered chemically, contain sulfo-compounds are quite different from these, the latter being Neralol of the Badische Anilin- und Sodafabrik and the sulphite waste lye concentrated by evaporation.

Of 100 parts of the organic substance contained in the waste lye about 50 parts are taken up by the animal skin and retained. The percentage of lime in the waste lye is troublesome and various admixtures have been employed for removing the lime. The tanning action of the waste lye is, however, generally changed by these admixtures; alkalies are particularly harmful in this respect. On the contrary, by adding lactic acid the tanning action of the waste lye is distinctly increased; the quantity taken up by the animal skin is thereby increased from 50 to 60% calculated with reference to the organic substance contained in the waste lye.

Sulphite waste lye has already been largely used in tanning, and indeed concentrated sulphite waste lye is obtained from abroad, the cost being of course, increased by the duty.

OCEAN FALLS.

Debenture holders of the Ocean Falls Co. will fare much better than at first supposed. An amalgamation of the largest paper plants on the Pacific Coast with the company has been practically concluded. The companies interested are the Crown Paper Company of Portland, the Quatsino Sound Pulp Company, the Powell River Pulp and Paper Company, and the Ocean Falls Company. By the terms of the agreement the latter plant will be operated at once, and a \$3,000,000 paper mill will be constructed. The capitalists behind the merger are Messrs. Fleishhacker Brothers and William Pierce Johnson, all of San Francisco. The latter is president of the National Bank of California, and Mr. Mortimer Fleishhacker is president of the Anglo-London and Paris National Bank of San Francisco. These gentlemen have agreed to guarantee fifty per cent. of the bonds of the Ocean Falls Company, as well as to spend the above-mentioned sum on development work on that property. In order to validate the agreement a meeting of the shareholders of the Ocean Falls Company will be called, but no dissension is anticipated. The negotiations on behalf of the debenture holders were carried on by Mr. J. Hamilton Benn.

THE MANUFACTURE OF DARK-COLORED PAPERS.

When making better kinds of dark-colored papers in many cases it is sufficient to take unbleached or half-bleached pulp instead of bleached pulp. One thereby saves not only the bleaching agent but also the dye requisite for giving the paper the required dark shade. Further, unbleached fibres have a greater affinity for dyes than bleached.

A very frequently required tint is e.g., a brownish Bordeaux; this is obtained best by employing unbleached, soda cellulose and a combination of Bordeaux and brown.

Deep red tints and also deep green and olive tints which are now frequently required are likewise preferably made from unbleached pulp.

In most of these papers (paper covers of catalogues, passe-partout, covers of files, better kinds of wrapping paper, etc.) fastness to light is important. This is obtained by employing mineral colors, but against their employment is the fact that they readily render the paper flabby or limp when a certain limit is exceeded; also, it is not possible so to fix mineral colors that they do not come off when the paper is rubbed. Therefore it is preferable to employ so-called substantive aniline dyes which are put on the market under various names, such as diamin, diamin genuine dyes, etc., and are sufficiently fast. As these dyes are almost completely absorbed by the fibre, there is less reason to fear complaints owing to colored waste water.

By observing the above hints the manufacture of many papers can be made more rational.

The New Zealand Paper Mills Company, Ltd., suffered last spring by the inundation of the Maitara River, which caused considerable losses on materials and stock. The Maitara mill lost £3,250 and £1,200 are required to bring buildings and machinery in shape again. The profits after paying a half-yearly dividend of £4,200, will be used to cover the losses mentioned. No dividends were declared.

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Utilization of Resinous Woods.

THE article appearing in this issue by Mr. John S. Bates, is the most important discussion of this subject which has ever been published. The utilization of resinous woods in manufacturing paper has been the subject of the greatest importance, and beset with greatest difficulties for a number of years. It is well known that the wood possesses good paper making fibre, but the difficulty in abstracting the resinous matter has been very serious.

This present article, the first instalment of which appears in this issue is a discussion of two years' work which successfully solved this problem. The methods discovered and properties used are unique, and are practicable in commercial practice. There is no doubt that this will mean a great change in the manufacturing of paper in southern United States.

We recently had occasion to comment on work along the same line which was carried out by Mr. McGarvey Cline, formerly Director of the Forest Products Laboratory at Madison, Wis. These two investigations will certainly revolutionize the use of southern pine in the manufacture of paper—the principles involved and the methods used are of interest to Canadians, for we have in this country a number of woods carrying percentages of resinous matter. Our spruce through western Ontario have sufficient resinous matter to give great difficulty in the manufacture of sulphite. Some other species of wood which we have, contain considerable matter of this nature which does not allow of their

use in the ordinary manufacture of paper. These principles worked out by Mr. Bates are of the greatest importance to us, both from a scientific and trade point of view, because there is no doubt that the utilization of these resinous woods of the South will effect the low grade paper market in the United States.

The Canadian Pulp and Paper Association.

THE Association will hold a banquet and meetings on January 22nd, Windsor Hotel, Montreal.

It is not quite a year since the agitation was first started for the formation of this Association. The progress has not been as rapid as many of those interested in the organization had hoped, but we believe that a great many have come to realize the great value of such an organization. There is no doubt that the paper trade in this country has need of a well supported organization of this kind, which will be of unquestionable benefit to each individual member. The main questions which are arising from time to time about trade customs, duties, tariffs, expansion of the industry, and all such matters, can only be handled by a central organization. The Association of the United States has been so beneficial, that the book manufacturers have now organized a separate Association of their own, under Judge Moore.

While the number of mills making pulp and paper in Canada is not very large, yet the needs of this organization are very great, and we are glad to note, are appreciated. All interested in pulp and paper, whether members of the Pulp and Paper Association or not, should attend its meetings on January 22nd, at the Windsor Hotel, Montreal.

Following is the programme proposed.

MORNING at 10.30 o'clock.—Meetings of sections for discussion in market conditions, trade customs, tariffs, and other matters of peculiar interest to the different branches of the industry.

AFTERNOON at 2.30 o'clock.—Election of officers; report on past year's work; discussions on (a) value of statistics, (a) tariff, (c) transportation, (d) technical co-operation.

EVENING at 7.30 o'clock.—Banquet at the Windsor; price of tickets, \$5, inclusive.

Scandinavians Disappointed.

THE pulp and paper trade in the old country, especially in England, is talking of nothing else at the present moment but the disappointment of the Scandinavians, which they, themselves, admit in the United States market since the passing of the new tariff law. They have been holding up large stocks for Americans at strong prices, but have found that other competition from Canada and elsewhere has been fairly keen. Many of the largest pulp buyers say that they will be hard hit by Canada as they expected much stronger prices in the American market. This is quite a remarkable circumstance since a great deal of talk was made during the tariff session on this point. The fact that it has not panned out as the Scandinavians themselves anticipated is a matter of the greatest significance. Certainly Canada has not sold very much more sulphite pulp since the new tariff enactment. Conditions have not been very brisk during the last few months. The passing of the Currency Bill has tended to steady matters somewhat so that it is anticipated that trade will be a little brisker than it has been for some time past. The sulphite condition is most interesting at the present moment, but it looks as if Canada would not suffer to any extent.

The accounting department of the Spanish River Company has been removed from Toronto to Sault Ste. Marie, to the offices of the Lake Superior Paper Company, under the direction of Lionel Lamb, comptroller of the company. The out branches in connection with the mills at Espanon, Sturgeon Falls and Sault Ste. Marie, are now conducted at each of these places. The executive and sales offices remain in Toronto.

ELECTRICAL TREATMENT OF CELLULOSE.

A recently published French patent, by Mr. Albert Nodon, deals with a process for electric treatment of cellulose. An application has also been made for an English patent. The inventor remarks that the known methods are expensive, variable and defective, because by dipping the materials to be treated in vats half-filled with saline solution those which are immersed are more affected than what is outside. On the other hand, by previously injecting the materials with various salts and then subjecting them to the action of electric current—the materials being too humid—the current is shunted by the liquid and does not reach the inmost parts. The new process consists in first treating the materials with a saline solution, but only superficially, and then subjecting them to the prolonged action of electric current so as to facilitate penetration of the current into the heart of the materials treated. The passage of electricity is favored by a certain degree of moisture in the cellulose. Sufficiently prolonged its action and ionization, caused by the current, produce complete transformation of the cellulose in form of polymerisation of the molecule. The new substance thus obtained is imputrescible, indestructible by exterior agents, such as wood myceliums in presence of moisture, air and heat. Moreover, mechanical resistance of the cellulose is greatly augmented and physical aspect more or less unchanged.

INFUENCE OF SIZING.

H. Frederking, a German chemist, has just made known the results of his work in determining the influence of the sizing of paper and the resistance of the text of documents to removal by mechanical or chemical means in which he says that the harder the surface sizing and the closer the surface texture of the paper, the more readily are written, typewritten or stamped characters removed.

A striking exception to this rule is found in the case of parchment papers, from which characters in writing ink can seldom be removed entirely without trace. Such papers, however, hardly fall within the range of practical application for documents. As a guard against falsification, document papers should be relatively soft-sized; papers sized with rosin are to be preferred from this point of view to papers sized with gelatin because certain of the chemical ink removing agents leave stains on rosin sized papers.

The prejudice against typewriting for documents is scarcely justified, since many brands of modern typewriter ribbons give characters as difficult to remove as characters written in ink, sometimes even more resistant. The treatment of documents with a protective varnish is of little value as a safeguard against falsification; such varnishes cause the spreading of typewritten or stamped characters and are only available for documents written in ink. With hand tub sized papers, the varnish remains on the surface and is easily removed by solvents, while with softer sized papers the protection afforded by the varnish is so slight that it does not compensate for the unsightly appearance produced.

W. S. Boyd, sales manager of Price Brothers & Co., Jonquiere, Que., was in Toronto last week on his return from an extended business trip to the Western States.

CHEMICAL UTILIZATION OF SOUTHERN WASTE

By JOHN S. BATES, A.B., B.S., Chem. E., Chemical Engineer,
Research Laboratories of Arthur D. Little, Inc., Boston, Mass.

The following article is the dissertation covering two years work on the manufacture of pulp and paper from resinous woods.

The results here outlined will revolutionize the use of these woods.

This article is published exclusively by the author in the Pulp and Paper Magazine.

INTRODUCTION.



HERE are two phases of conservation to be considered in dealing with the forestry problem. The first involves provision for the preservation and rejuvenation of timber growth, into which enter such methods as selective cutting of trees, reforestation and prevention of forest fires. The second phase of the problem has to do with the efficient utilization of the raw materials furnished by the forest.

In the utilization of trees not fit for lumber and of the waste from forest and saw mill there is a broad field for the technical chemist. Considerable attention has been paid to these matters during the past few years and the technology of the subject is steadily advancing. The chief retarding influence is that, in spite of the enormous quantities of wood waste, the inherent value of the raw material is relatively small. The economic value of the finished products which can be manufactured from wood waste is in most cases not great and the cost of transportation and treatment of the wood is often prohibitive. The methods of utilizing wood waste differ rather widely in principle and in scope, and there are decided limitations in treating any one species of wood.

RESINOUS WOODS.

One of the most reasonable points of attack is in the direction of waste resinous woods. Several processes for the treatment of these woods are now in successful operation and others give promise of satisfactory development. The representative species are the Douglas fir, the Norway pine and the western yellow pine of the Pacific slope and the long-leaf pine and the associated Cuban pine of the southeastern states. The species of less importance are the digger, lodgepole, sugar and pinon pines of the West and the short-leaf and loblolly pines of the South.

The most abundant of the resinous woods and the most promising from the industrial standpoint is the long-leaf southern pine (*Pinus palustris*). As is well known this pine is the chief wood of the southeast and holds first place among the commercial woods of the country. The utilization of the waste wood is now assuming special significance as an increasingly important factor in the naval stores industry. The virgin forests which have supplied the world with turpentine and rosin are disappearing at an alarming rate and the principles of conservation demand that the tapping and wasting of the living trees should be relieved as far as possible by the recovery of resinous products

from the felled waste wood. Moreover, long continued forest operations have resulted in the accumulation of resinous waste in the forest and much of this waste has remained sound by reason of the preservative properties of the oleoresin.

The forests of long-leaf pine occupy a strip some 125 miles wide along the coast of the Atlantic and the Gulf of Mexico and constitute the main timber growth of the states from North Carolina to Texas. By reason of devastation of the forests, the turpentine centre has moved in late years from North Carolina to Florida, while the lumbering centre has advanced to Louisiana and Mississippi. It is estimated that the forest areas cover over 70 million acres and that the stand of long-leaf pine amounts to about 232 billion board feet. U. S. Dept. Agric., Forest Service, Bull. 99, p. 81.

According to the report of the Census Bureau, the cut for the year 1910 of all eastern "yellow" pines, (of which the greater part was long-leaf pine), amounted to 14 billion board feet. This represents about two-thirds of the total cut of resinous woods throughout the entire country. The consensus of opinion seems to be that in ordinary lumber operations at least 60 per cent of the actual wood in the tree is wasted in transforming the same to sawed lumber, about 35 per cent being lost at the mills in the form of sawdust, slabs, edgings and shavings, and 25 per cent remaining in the forest in the form of tree-tops, branches, stumps, etc. (U. S. Dept. Agric., Y. B. Sep. 534, 1910, p. 257). This would signify that the waste amounted to 21 billion feet, as the census figure refers to finished lumber. Assuming 1,000 board feet to be equivalent to 1 cord, this would represent an annual production of 21 million cords of waste resinous woods in the South. The estimation by Veitch and Merrill (U. S. Dept. Agric., Bur. Chem., Bull. 159, p. 24 of 8 million cords of waste woods of all kinds annually seems to be erroneous, as they have apparently taken the census figure as representing 100 per cent of the actual wood cut.

It is of course impossible to determine exactly the total amount of long-leaf pine waste produced each year. Furthermore, the waste varies widely in oleoresin content and a large proportion would be too lean to warrant treatment for the recovery of resinous constituents. The effective utilization of this class of wood waste by a variety of processes would surpass the present production of the country in the items of low-grade papers (other than newspaper), rosin, rosin oils, turpentine, pine oil, rosin spirits, wood tar, soft wood charcoal and ethyl alcohol.

Composition of Long-Leaf Pine.

The constituents of economic value existing in long-leaf pine are the oleoresin and the wood itself. The products actually obtained from the pine depend on the methods of treatment.

The oleoresin varies widely in amount but its composition is fairly uniform, the volatile oils comprising approximately 20 per cent of the crude gum, and colophony or rosin making up the remaining 80 per cent. The volatile oils or "crude turps" yield from 60 to 80 per cent of actual turpentine and from 40 to 20 per cent of heavier oils, known collectively as "pine oil." As it exists in the wood, the turpentine consists mainly of terpenes of the formula $C_{10}H_{16}$, chiefly α -pinene with smaller amounts of β -pinene, dipentene, camphene, and traces of other oils. (U. S. Dept. Agric., Forest Service, Bull. 119, p. 7; Bur. Chem. Bull. 144, p. 21). The turpentine fraction distills between 155° and $180^{\circ}C$, the main portion passing over close to the boiling point of pinene (155 – $156^{\circ}C$). The pine oil consists essentially of terpineol, with small amounts of borneol, fenchyl alcohol, limonene, cineol and other terpenes and related compounds. Gum turpentine issues from the sapwood of the living tree and consists almost entirely of pinene, whereas the volatile oils of the heartwood contain appreciable amounts of dipentene and heavier oils.

The colophony or rosin consists chiefly of mono-basic rosin acids. The main constituent (80–90 per cent) is believed to be abietic acid or its anhydride. Authorities differ as to the exact composition of abietic acid, some holding to the formula $C_{20}H_{30}O_2$ and others to $C_{20}H_{28}O_2$ (see Forest Service, Bull. 119, pp. 7–8 for references). There are no esters, but bodies of a lactone nature are present in small quantity, as shown by the discrepancy between the saponification and acid numbers.

The true wood, (Klason, see Schwalbe, "Die Chemie der Cellulose," pp. 395 and 441; Dean and Tower, J. Am. Chem. Soc., 29, (1907), p. 1119) considered apart from oleoresin and moisture, is essentially lignocellulose, made up of 55–65 per cent of stable cellulose, $(C_6H_{10}O_5)_n$, associated in a colloidal state with about 30 per cent of lignin, a carbohydrate of uncertain composition and higher carbon content, approaching the empirical formula $C_6H_7O_3$ (Cross and Bevan, Researches on Cellulose, 3). The balance is made up of lower carbohydrates, chiefly pentosans and hexosans, and small amounts of protein and mineral ash. The moisture content of pine varies from about 5 per cent in very fat wood to 30–40 per cent or more in some classes of lean wood, average air-dry wood containing about 20 per cent of moisture. This is an important consideration in all calculations.

Classification of Wood Waste.

It is well to have in mind the various classes of wood waste which are available. The mill waste, which represents about 35 per cent of the original tree, is chiefly sawdust, slabs and edgings. The sawdust is usually low in oleoresin content, because the average saw lumber is lean. Moreover, the fine state of division allows more or less volatilization of the turpentine. The slabs are available in large quantities and offer one of the most convenient forms of raw material. Their percentage of oleoresin is of course very high and its removal is a problem to be considered. Furthermore, the

slabs come from the outer sapwood of the tree, where the oleoresin content is lowest. The richest slabs are those from the "box face" of trees which have been tapped for gum spirits of turpentine. The waste remaining in the forest is abundant, but is not so accessible. Large branches, tree-tops and occasional logs left by the lumbermen afford raw material in a form compact enough for handling. Stumps usually have a high oleoresin content and offer a great bulk of solid rich wood. Their utilization is of especial significance in cases where the land is being cleared for agricultural purposes. Uprooting of the stumps and perhaps freeing from dirt and roots must be taken into account. The most attractive class of forest waste is the "dead and down" material known as "lightwood." After the period of turpentine orcharding, the exhausted trees are in many cases allowed to remain until they fall. The bark and the outer sapwood decay and in five to fifteen years there is left a resinous log, which resists the natural processes of disintegration for long periods. This explains the large supply of lightwood now available.* Lightwood is often charred by the ground fires which run through the pine forests.

Turpentine Orcharding.

The oldest and most approved method of obtaining rosin and turpentine depends on making incisions in the living tree and collecting the oleoresinous exudate. This general operation is known as "orcharding." The turpentine is recovered from the crude gum by distillation and the non-volatile rosin is purified by a simple process of straining while still in a molten condition.

The "gum spirits of turpentine" so obtained are always taken as the highest standard of quality, since they are not contaminated by those decomposition products formed during certain other treatments of resinous woods. The orcharding method is simple and requires but little outlay for apparatus. The exhausted trees are available for lumber, and the choice of areas for orcharding is now usually made with this end in view. On the other hand, the yield from a single tree is small, the average being 10–12 pounds of crude gum per annum (Herty, J. Ind. Eng. Chem., Jan. 1913, p. 67). This necessitates the exploitation of a very large number of trees and any but the most careful methods of orcharding result in rapid devastation of a forest.

Destructive Distillation.

The aim in this process is to heat the richer grades of pine in closed retorts at progressively higher temperatures in order to first liberate the volatile oils of the wood in a comparatively unchanged condition and finally to decompose the rosin and the wood into a series of products, which are for the most part volatile at high temperatures. Below $200^{\circ}C$, the main products—moisture, turpentine and pine oil—are primary in nature. With continued increase in temperature the wood itself suffers decomposition, with formation of water and small amounts of acetic and formic acids, then light tar oils, gas and small amounts of methyl

*A. Tschirch, in "Die Harze und die Harzbehälter," second edition, describes the increased accumulation of rosin in a wounded or dead tree as a pathological process carried on by minute organisms.

alcohol, and finally heavy tar oils; charcoal is left as a residue in the retort. At temperatures approaching 300°C. rosin begins to decompose, the successive products being water, light rosin spirits, heavier rosin oils and pitch.

The main problems in the destructive distillation process are uniform distribution of heat and accurate control of temperature. The types of retorts are numerous and differ rather widely in methods and heat application.

The fractions obtained by the destructive distillation of resinous wood are for the most part mixtures of the decomposition products of rosin and wood. Purification of the products is for this reason difficult and imperfect. The number of end products is relatively large, but many of them are of low inherent value. Destructive distillation has the advantage, however, of adapting itself to rough and even charred wood, without the necessity of finely dividing the same. Furthermore, certain valuable products, such as pine tar, tar oils and creosote, can be obtained by this process alone.

Steam Distillation.

Although the boiling point range of turpentine lies above 155°C., both turpentine and pine oil are volatile with steam at temperatures above 94–96°C. The steam distillation process aims to remove the volatile oils from the wood by this simple agency. The finely divided resinous wood is subjected to the action of saturated or superheated steam in suitable retorts for several hours, until the greater portion of the crude turpentine has been carried over. The volatile oils are readily separated from the aqueous layer in a distillate and by a series of fractional distillations in a column still the end products, wood turpentine and pine oil, are isolated in a favorable state of purity.

While the principles involved in the steam distillation process are very simple, the utilization of the wood is incomplete, in that only the volatile constituents are recovered. The limitations have proved so great that nearly all the commercial plants have ceased operations within the past two or three years. It seems probable, however, that steam distillation will remain as an important step in more comprehensive treatments of resinous pine.

EXTRACTION PROCESSES.

I. Volatile Solvents.

Rosin and turpentine are soluble in a considerable number of volatile solvents, the most common of the cheaper ones being naphtha, gasoline and coke-oven benzene. The ordinary commercial solvent is a light gasoline, all fractions of which are volatile below 130–140°C. The extraction process depends on the removal of the rosin and turpentine from the finely divided wood by the agency of a solvent; the extract is subsequently distilled to recover first the solvent and finally the turpentine and pine oil, leaving the rosin as a residue.

In some cases (Walker, J. Soc. Chem. Ind., 1911, p. 394; U. S. Pat. 922,369 and Yaryan, U. S. Pat. 915,400; 964,728; 992,325), the turpentine is first removed from the shredded wood by steam distillation in order to escape the usual danger of retention of solvent by the turpentine. There is also a possibility of using the extracted wood for the pro-

duction of paper pulp, although the fine state of division of the wood would detract from its value in this connection.

The main products—turpentine, pine oil and rosin are in most respects of very favorable quality, since they are free from those decomposition products formed at higher temperatures in the other processes. The chief difficulty lies in the loss of solvent during the cycle, amounting as it does to 20–25 gallons per cord of wood extracted.

2. Alkalis.

When rosin is heated with caustic soda, sodium carbonate or equivalent alkali, the rosin acids combine with the alkali to form a soluble rosin soap. Turpentine and pine oil are stable in presence of dilute solutions of alkali and may be removed therefrom by distillation with steam. Wood itself is affected only in slight degree on heating with dilute alkali at low steam pressures, a small proportion of the lignin being carried into solution. These well-known facts have suggested the use of dilute alkaline solutions to effect a separation of the primary constituents of resinous wood.

A more detailed discussion of the factors entering into the extraction of resinous wood with alkalis will be found in the second part of this paper.

Bath Processes.

Commercial operations on a limited scale have been carried on for some time whereby the turpentine and pine oils and incidentally part of the rosin are extracted from the wood by a hot bath of non-volatile or high boiling material. Molten rosin alone and mixtures of rosin, pitch, pine tar, pine oil, etc. have been used as baths for flooding the wood. Final injection of steam into the bath carries off the turpentine and pine oil and permits of using the bath for treating the next batch of wood. The extracted wood may be used as fuel or it may be destructively distilled.

Hydrolysis.

The hydrolysis of the lignocellulose complex of wood by acids and the production of ethyl alcohol from the fermentable sugars so formed constitute a problem of ever-growing interest. Longleaf pine has been the raw material used in a large proportion of the investigations along these lines and at least two alcohol plants in this country are now treating this wood on a large scale.

Very dilute solutions of sulphurous, sulphuric or hydrochloric acid are used as hydrolyzing agents and rather high steam pressures are necessary to effect the decomposition of the lignin and cellulose. The fermentable sugar, calculated as dextrose, amounts to 10–20 per cent of the dry weight of the wood under favorable conditions. The extract is neutralized with lime, cooled, and treated with yeast. After fermentation is complete, the alcohol is distilled off and rectified.

The attractive feature of the process is the high yield of alcohol, a material which is becoming of more and more importance in the industries. Furthermore, it is the only process especially suited to the use of sawdust, and it does not depend for its success on the oleoresin content of the wood.

Beyond leaving this subject, an alternative use of the hydrolyzed wood mass should be mentioned. It has been found (Zimmerman, J. Royal

Soc. Arts, 61, 1912, pp. 69-81; J. Soc. Chem. Ind., 31, p. 1197) that the sugar liquor and "pulp" formed by treating sawdust with SO_2 solution under pressure is admirably suited as a basis for a valuable cattle food.

Paper Pulp.

The use of long-leaf pine for the manufacture of pulp and paper is an industrial development of recent years. Laboratory and commercial experiments on this new raw material have proved fairly successful and the indications are that a paper industry of no mean proportions will be built up in the South. Several plants are already in operation and other extensive projects are claiming the attention of pulp and paper experts.

The soda process depends on the decomposition and solution of the lignin by a caustic soda liquor at high temperature and pressure. Of perhaps more significance is the sulphate process. The presence of the sodium sulphide improves the color of the pulp and simplifies bleaching; at the same time, the fibre is smoother and firmer, and imparts better wearing qualities to the paper.

Sound, lean wood is best adapted to pulp making. In addition to the direct supply of logs, the large quantities of mill waste in the South furnish a convenient and cheap source of raw material.

To make the treatment of the more resinous classes of pine waste reasonable and profitable, attention must be given to by-products. Rosin and turpentine may be first removed by a volatile solvent (Rowley, U. S. Pat. 942,106). Several of the methods suggested have aimed at preliminary removal of the volatile oils in a pure form by distilling at moderate pressures with steam alone (Hough, U. S. Pat. 903,859) or in presence of alkali solutions (Craighill and Kerr, U. S. Pat. 817,960). It has been claimed that part of the rosin can be melted down and tapped from the bottom of the digester (Saylor, U. S. Pat. 1,004,473; Hoskins, U. S. Pat. 770,463). The spent pulping liquors may be evaporated and destructively distilled to yield rosin spirits, pyroligneous acid, tar, etc (U. S. Dent. Agric. Bur. Chem., Bulletin 159).

EXPERIMENTAL

Scope of Investigation.

In the chemical utilization of wood waste it seems highly desirable to aim at simplicity of treatment and at the same time provide for as complete a recovery of valuable products as is economically possible. Usually one type of treatment is paramount in a plant and any complication is looked upon with disfavor. And it is quite apparent that a succession of widely varying types of treatment is not conducive to the smooth operation of a mill. A limitation of the number of end products is a decided advantage and these products should be obtained in the most direct manner and in as pure an initial form as possible.

It was with these considerations in mind that an investigation of southern pine waste was undertaken. The problem was limited to the more resinous classes of wood waste. Considering the recent demonstration that excellent paper pulp can be obtained from long-leaf pine it seemed advisable to employ a mild first treatment. This necessitated the preparation of the wood in the form of chips or the type demanded by a pulp mill. It remained to choose a method for treating

the chips to separate the oleoresin from the wood itself and allow isolation of the three end products—turpentine, rosin and paper pulp.

Since rosin is readily saponified by alkalis and thereby rendered soluble in water, it was decided to make use of this principle in extracting the rosin from the wood. A mild treatment was necessary to prevent undue attack of the actual wood by the alkali. The fact that turpentine and pine oil are volatile with steam at temperatures far below their boiling points suggested carrying out the preliminary extraction at low steam pressures, thereby allowing separation of the volatile oils. After removal of the rosin and turpentine the wood could be steamed with stronger alkali under more severe conditions, for the production of paper pulp.

In addition to the investigation of the factors affecting such a treatment of the wood, it was important to determine the quality and yields of the products and to provide for their purification.

Historical.

There have been a number of suggestions for the utilization of resinous materials involving the principle of alkali extraction.

Craighill and Kerr (U. S. Patent 817,960, April 17, 1906) have patented a process by which the chipped wood is treated first with a small volume of liquor containing an amount of caustic soda "just sufficient to saponify the rosin and oils and neutralize the (volatile) acids without dissolving other extractive matters of the wood." Steam is admitted long enough to distil the terpenes; water is then added in order to submerge the chips in alkaline solution, and steaming is continued until saponification of rosin is complete. This solution is then drawn off and the chips treated with a stronger caustic solution for the production of paper pulp.

J. Aktschourin (French Patents 432,998, Aug. 5, 1911, and 433,424, Aug. 11, 1911; Ger. Pats. 248,275, July 12, 1912 and 257,015, Jan. 12, 1913) provides for the extraction of resinous material by heating with dilute alkali below 100°C . at several atmospheres pressure. The lower temperature lessens the attack of the lignin. The liquor is drawn off and cooled to precipitate a certain amount of emulsified resin and rosin soap. The filtrate is used in digesting the fibrous material at high steam pressure for pulp.

Where turpentine is the only product desired, alkali has in some cases been added primarily to disintegrate the rosin and thereby permit a more nearly complete distillation of the volatile oils (Hough, U. S. Pat. 903,471).

Kerr (U. S. Pat. 832,863) has suggested a continuous process for the removal of turpentine and rosin from wood, the turpentine being first distilled with steam and the rosin being subsequently dissolved in alkaline liquor.

Preliminary Experiments.

From a shipment of assorted pine waste, the "box-face slab" material was selected as being best suited to a laboratory investigation. This wood was sound and clean, and very rich and uniform in oleoresin content. When reduced to chips or shavings the wood had a strong turpentine odor and burned freely with a characteristic, smoky flame. Box-face slabs constitute a comparatively expensive and restricted source of raw material

for commercial supply and the oleoresin content (30-40 per cent) is higher than that of average lightwood (15-25 per cent). This material, then, should present perhaps the severest conditions for complete extraction of rosin and turpentine, but the yields must be considered a maximum for southern pine waste.

A series of experiments was first made to determine the behaviour of the wood with alkalis under various conditions of temperatures and pressure. Sample slabs were carefully cleaned by the removal of bark, rosin "scrape" and other surface material. Only the clean, inside wood was used in the investigations. Some of the wood was reduced to large chips—about 1 in. x $\frac{3}{4}$ in. x $\frac{1}{4}$ in., some to small chips—about $\frac{1}{2}$ in. x $\frac{1}{4}$ in. x $\frac{1}{32}$ in.—and another portion to thin shavings.

The action of volatile solvents was of course rapid and simple. Shavings and small chips were readily freed from rosin and turpentine by extraction in a Soxhlet, leaving the wood clean and decidedly whiter in color. The slow penetration in the case of the larger chips pointed to the difficulties which would be encountered in using this type of treatment on chips of the normal pulping size. Ether, gasoline, ligroin and petroleum ether, all yielded clear, bright yellow rosin, showing the excellent quality of the rosin as it existed in the wood. Ethyl alcohol, methyl alcohol, and acetone showed slightly greater extractive powers, the rosin, however, being deeper in color and somewhat cloudy. Ether is the most satisfactory solvent for rosin, the solubility being 38-39 per cent at 23°C. (H. A. Loos, "A Study on Colophony Rosin," Columbia University, 1900), and was used in subsequent quantitative determinations.

Extraction with alkalis is different in principle. The rosin is saponified and dissolved as a soap, while the turpentine is liberated from the rosin without itself dissolving in the alkaline solution. An important consideration is that the alkali causes partial decomposition of the wood itself. The lignone group of the wood is converted by alkaline solutions at elevated temperatures into soluble derivatives, which are acid in nature but of somewhat uncertain composition (Cross and Bevan, "Wood Pulp and its Uses," p. 62). This principle is carried to the limit in ordinary pulping operations, where the final pulp consists of cellulose practically free from lignin. Heating the wood in dilute caustic solutions at the moderate temperatures necessary for rosin extraction represents the initial stage of lignin decomposition. The dissolved bodies from this source consist mainly of organic acids of the type of saccharinic and isosaccharinic acids, as well as those of a lower order, such as formic and acetic acids. In addition, there are dissolved those water-soluble bodies and lower carbohydrates, which exist in the wood to the extent of 5-10 per cent—chiefly pentosans and hexosans, such as the glucosides of xylose, mannose, etc. (see Klason and Segerfelt, *Papierfabrikant*, 9, 1911, pp. 1093-9). For convenience, the decomposition products of the lignin of the wood will be designated as "humus" throughout the discussion.

Extraction of Rosin-free Wood with Alkali.

To study the behaviour of the humus, pine shavings were first extracted with ether and then heated with dilute solutions of caustic soda. The alkali extracts were clear, and brown or cherry red in color.

Addition of excess caustic soda caused no precipitation of the organic bodies. The same was true of treatment with sodium chloride. Barium chloride gave a fine, brown precipitate of the barium salts of the humic acids, leaving a pale orange-colored supernatant liquor. Titration with mineral acids gave no precipitate up to the sodium bicarbonate stage (phenolphthalein end-point). On fully acidifying, there resulted almost complete precipitation of the humus, due to the breaking up of the sodium salts. The humus was brown, granular and easily washed by water. Only a trace proved soluble in ether, but the mass became somewhat gelatinous. After acidifying a portion of the alkali extract to the sodium bicarbonate stage, CO₂ was passed through the solution. A large proportion of the humus was precipitated. (see Rinman, U. S. Patents 1,005,882, 1,017,320 and 1,045,889, and J. Soc. Chem. Ind., 31, p. 183).

Extraction of Resinous Wood with Alkali

The behaviour of the resinous wood with alkalis is modified by the presence of rosin and turpentine. Dilute caustic soda and sodium carbonate showed little action on resinous shavings or chips in the cold. Shavings were readily extracted, however, by heating at 70-100°C. Chips were much more resistant, although the small chips were thoroughly extracted on boiling with dilute caustic soda for $\frac{1}{2}$ -2 hours, accompanied by evolution of turpentine.

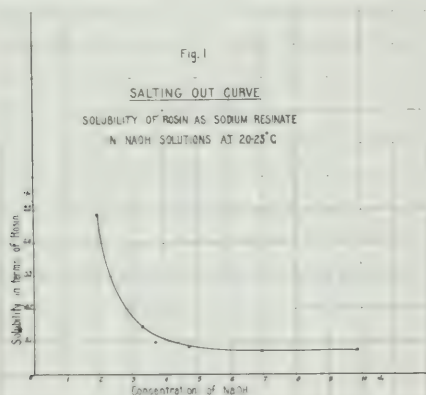
The brown extracts consisted mainly of sodium resinate and the sodium salts of humic acids. Addition of excess caustic soda in the cold caused precipitation of most of the rosin soap, which carried down some of the humus mechanically. Sodium chloride gave the same general action. Barium chloride gave a precipitate of the barium salts of both the rosin and humic acids. As in the case of the pure wood extract, mineral acids gave no precipitate on titrating to the phenolphthalein end-point. Further additions precipitated rosin and humus together, the small quantity of humus being entrapped by the gummy rosin. Direct melting of the precipitate gave bright rosin, with humus particles disseminated throughout. Extraction with ether involved some difficulty in separating the ether layer from the gelatinous humus, but yielded a clean rosin of pale brown color. On saturating the alkali extract with CO₂, partial precipitation of both rosin and humus took place.

The "Salting-Out" Method for Isolation of Rosin.

Isolation of the rosin content of the alkali extract was most conveniently accomplished by salting out the rosin soap with caustic soda. Sodium chloride was apparently just as effective, but rather complicated the process by the introduction of another reagent. The caustic soda method was chosen because direct and simple. Humus itself is soluble in alkaline solution, but a small part is carried down by the colloidal soap. Sodium resinate is quite soluble in hot alkaline solutions, as well as in neutral or faintly alkaline solutions in the cold, but is only slightly soluble in cold alkaline solutions when the concentration of free caustic soda exceeds about 4 per cent. This solubility determines the loss in recovery of the soap. The method has the advantage of utilizing the same reagent as is employed for extracting the wood and cooking for pulp. No acid is necessary for precipitating

the free rosin, if the soap is to be used as such, and no acid-resisting apparatus need be provided. The alkali used in extracting the wood and precipitating the soap can be saved partly in the form of sodium resinate (thereby enhancing the value of the rosin fraction), and partly in the form of brown, supernatant liquor to be used as a source of alkali for the soda cook of the extracted chips. After the pulping operation, the alkali can be recovered in the usual way by evaporating, incinerating and causticizing the waste soda liquor.

As regards actual manipulation, it was found best to add the excess of caustic soda to the hot extract, so that precipitation of the soap took place rather slowly as the solution cooled down. Very strong alkali—above 10 per cent NaOH—gave somewhat syrupy solutions, with increased contamination of the soap by humus and without appreciable gain in the quantity of soap precipitated. The soap precipitate proved difficult to filter. The liquor was separated by draining or syphoning. With this procedure the soft precipitate retained an appreciable quantity of liquor. The bulk of the humus was removed from the soap by dissolving the same in the minimum amount of hot water and salting out again with caustic soda.



To determine the power of caustic soda in salting out rosin soap, a series of experiments were carried on with pure rosin on a quantitative scale. The results are summarized in Figure 1.

Chem. bright rosin, prepared by extracting a good grade of paper-maker's rosin with ether, was recovered and dissolved in a slight excess of warm, dilute caustic soda solution. Separate portions of the strong rosin soap solution were diluted with water and treated while warm with varying quantities of strong NaOH solution, so that part of the sodium resinate was in each case salted out. The solutions were placed in stoppered bottles and allowed to stand overnight to come to room temperature (20-23°C.) and to assume a state of saturation at that temperature. The solutions were then filtered, giving clear pale-yellow filtrates. 100 cc. portions were reached and shaken with ether to determine the rosin content. The results were here expressed in percentage strength of the solutions in terms of rosin (present as soluble rosin soap). The figures also represent solubility of rosin in grams per 100 cc. The balance of the solution was in each case titrated with standard

H_2SO_4 , using methyl orange as indicator. The results represent the total alkali expressed in terms of NaOH. The error due to the precipitation of free rosin by the acid is practically negligible. The actual causticity of the alkali varied from 95 to 97 per cent, small quantities of sodium carbonate being unavoidably present.

The results are not strictly accurate or comparable with one another. This is apparent, because of the presence of sodium carbonate in the caustic solutions and because of the slight differences in temperature. Furthermore, the quantity of rosin soap precipitated out may have had some influence on the solution itself, by reason of the colloidal tendency of sodium resinate. However, the general effect of increasing the strength of the caustic soda is quite apparent. The solubility of rosin soap in 1 per cent NaOH amounted to several grams per 100 cc., and for this reason was not determined. In 1.98 per cent NaOH the solubility was 0.4817 grams per 100 cc., while in 3.33 per cent caustic it dropped to 0.1445 grams. After a concentration of about 4 per cent NaOH was reached there was no pronounced decrease in solubility of the rosin soap; 10 per cent NaOH gave no more complete precipitation than 7 per cent caustic. This shows that rosin soap can be effectively salted out by strengthening the solution to 4 per cent NaOH or more, thereby leaving a supernatant liquor which would be of a convenient concentration for cooking the extracted chips for pulp.

A few quantitative determinations with sodium carbonate and sodium chloride showed that these reagents had practically the same salting out power as caustic soda when compared on an equivalent weight basis.

In applying the salting out method to the alkali extracts from resinous wood, it was found that the presence of dissolved humus, etc., increased to a slight degree the solubility of the rosin soap in the strong alkali.

EXTRACTION OF RESINOUS PINE WITH ALKALIS.

Temperature, pressure and nature of alkali proved to be important factors in the extraction of rosin and turpentine from the wood.

1. Experiments with Caustic Soda. Atmospheric Pressure.

Taking into consideration the necessity for steam distillation of the crude turpentine, little attention was given to extraction at temperatures much below 100°C.

Shavings heated at 100°C. in a dilute solution of NaOH, containing 1.5 times the amount of caustic theoretically necessary for saponification of the rosin in the weight of wood used, were completely extracted within 1 hour. This was determined by thoroughly washing the shavings with hot water, drying and extracting with ether. On the other hand, the largest chips (1 in. x $\frac{1}{2}$ in. x $\frac{1}{4}$ in.) were imperfectly extracted by treating at the boiling temperature with twice the theoretical amount of NaOH for a much longer period. The small chips were thoroughly extracted when 3 times the calculated amount of NaOH was used. The larger chips not only retarded the penetration of the alkali, but occasioned greater neutralization of the caustic before penetration was complete, by reason of the longer time in contact with the alkali and more extended decomposition of lignocellulose. The extracts were much darker on this account.

2. Heating Under Pressure.

For the preliminary experiments at elevated temperatures a small autoclave of about 1500 cc. capacity was used. The autoclave was fitted with a pressure gage, thermometer pocket and relief line leading to a condenser.

With shavings the evolution of turpentine commenced as soon as pressure was evidenced and the main bulk of the volatile oils distilled over with a low ratio of water vapor in a very few minutes. In about half an hour the yield of turpentine amounted to approximately 35 gallons per cord. Later experiments showed that the true turpentine content of this wood was about 45 gallons per cord. Frothing was excessive, especially during rapid evolution of the turpentine and care was necessary in controlling the relief line. Extraction of rosin was rapid and the extracts were noticeably darker than those obtained below 100°. The caramel odor detected in all the alkaline extracts was more pronounced in this case.

3. Vacuum Treatment.

The apparatus used consisted of a hemispherical porcelain bowl of about 4 liters capacity, set in a water bath and surmounted by a convex glass cover resting on a rubber gasket. A thermometer was inserted in the top and the delivery tube was connected to a condenser and receiving flask, the side tube of the latter being attached to a manometer and suction pump.

500 grams of thin chips were treated with 2500 cc. of 2.4 per cent NaOH solution, calculated to supply 3 times the amount of alkali necessary for saponification. The water bath and suction pump were first adjusted to carry on distillation at a high vacuum—20–25 inches—so that the temperature could be held below 70°C. The action of the caustic was not very rapid.

Frothing was excessive while turpentine was being evolved and constant attention was necessary to prevent surging over of the liquor. After four hours heating the distillate measured 165 cc., containing 28 cc. of water-white, sweet-smelling turpentine, which represented a yield of 27 gallons per cord. The recovery of volatile oils was incomplete and undoubtedly the distillate contained only the lighter fractions. At this stage the chips seemed pretty well extracted. A sample of the alkali extract gave a very clean, white precipitate of rosin soap on cooling, and the supernatant liquor was transparent and light cherry red in color.

The main portion was heated for some time longer under about 8" vacuum, and distillation proceeded much more rapidly at 85–90°. A small additional amount of turpentine was obtained, bringing the yield up to 30 gallons per cord. The liquor assumed a decidedly darker color, but the rosin soap precipitate was much cleaner than in the previous experiments.

EXPERIMENTS WITH SODIUM CARBONATE.

Sodium Carbonate was tried as an extracting agent in the hope that the attack of the lignocellulose would be minimized and solution of the rosin accomplished satisfactorily.

1. Atmospheric Pressure.

Shavings were readily extracted by dilute solutions of sodium carbonate at temperatures approaching the boiling point. The action was slow at

lower temperatures, but when shavings were added to a boiling solution of carbonate, there was instantaneous action, evidenced by vigorous frothing due to evolution of CO_2 and turpentine. After boiling for 3 hours, the solution was cooled, giving a clean-looking rosin soap precipitate and a transparent, reddish liquor. It was found that the extracts were decidedly freer from humus than in the case of NaOH, but all the solutions were brown and the problem of humus contamination was only one of degree.

2. Heating Under Pressure.

To determine the effect of pressure, 300 grams of thin chips were heated in the autoclave with 1100 cc. of 4.5 per cent Na_2CO_3 solution, containing 3 times the amount of Na_2O theoretically necessary for saponification. In $\frac{1}{2}$ hour the temperature reached 100°C. and in the next 15 minutes, while the pressure rose to 30 pounds, 16 cc. of turpentine distilled over, equivalent to 26 gallons per cord. The heating was continued for a total of 2½ hours up to 45 pounds pressure. The combined "turps" represented a yield of 33 gallons per cord. The final extract was dark brown, showing that carbonate even at low pressures has a decided action on the lignin. On cooling, the soap precipitate was whiter than in the case of NaOH.

3. Vacuum Treatment.

250 grams of thin chips were heated in the vacuum apparatus with 1500 cc. of 2.7 per cent carbonate solution (3 times theory). As low temperatures were ineffective, the water bath was kept boiling. After an hour or more at atmospheric pressure the solution was yellowish and considerable rosin was dissolved. Distillation was then carried on under a vacuum of 12–15 inches and water vapor and volatile oils came over at 78–82°C. Even after 4 hours the yield of turps only represented 15 gallons per cord. The liquor gave a very white precipitate of soap on cooling and the solution was perfectly transparent. However, removal of the turpentine was far from being complete.

In general, then, caustic soda seemed to be the more effective agent for extraction. Sodium Carbonate gave lighter extracts and somewhat cleaner soap precipitates, but penetration of the wood was incomplete and frothing rather more pronounced. Elevated temperatures and pressures facilitated the removal of rosin and turpentine, but occasioned greater attack of the wood itself. The size of the wood units proved to be a highly important factor in extraction of the oleoresin. A fine state of division—represented by the shavings—greatly simplified the problem of extraction. On the other hand, the production of good paper pulp necessitates the preparation of the wood in chip form and this introduces some complication in the preliminary alkali treatment.

Production of Pulp.

Preliminary experiments were made to determine the nature of the pulp obtainable from the box-face slab material. The cooking was done in the autoclave described above, the apparatus being standardized by the use of commercial spruce chips. Caustic soda was employed as cooking agent. The washed pulp was disintegrated in a small experimental beater and sample sheets were made up on a hand frame and in a wire stamp. The sheets were dried on a steam-heated dryer-roll

designed for the purpose and in some cases finished on a gas-heated calender roll. In this way a rough idea could be obtained of the relative merits of the different pulps for the production of paper.

Without going into detail, it was found that fibre of good quality was obtainable from the resinous long-leaf pine. Shavings gave low yields of rather short and non-uniform fibre, showing the necessity of preparing the wood in chip form. The pulp from the resinous chips was characterized by favorable length and strength of fibre. There was no appreciable difference between the pulp obtained from the resinous wood direct and that from the chips which had been first extracted with NaOH or Na_2CO_3 . The pulp from the resinous chips was harder to handle, because of the large amount of rosin soap mixed therewith.

The yields of moisture-free pulp varied from 17 to 25 per cent of the weight of the original wood, depending on whether the cooking was carried to the point of soft, light-brown pulp or stopped at the "raw" stage to give stiffer, darker fibre. Such yields would be too low to warrant a simple pulping treatment of the wood, although the figures represent the normal yields of 35-50 per cent on the basis of moisture- and resin-free wood. The recovery of rosin and turpentine becomes essential in the treatment of rich wood.

Pollution.

By ALEX. ANNANDALE.

This is a worry which Canadian Papermakers have not yet had to trouble much about, but it is a sure thing that sooner or later they will be forced to take up the question seriously. Doubtless the prevention of pollution is a very proper thing but when insufficiently informed legislators pass iron-bound laws binding manufacturers to impossible standards of perfection in outflow waters and when these laws are administered in a rigid fashion by local officials then the trouble begins.

In Great Britain most of the rivers are merely brooks in comparison with Canadian rivers, and the flow of water being so much less it is much more easy to cause serious pollution. Again, population in the manufacturing districts at any rate, is very much denser, so that there is much more sewage pollution. It is undeniable that the factories of Canada are rapidly increasing, and they are sure to continue to do so, and so will the population.

Manufacturers may be quite sure that their pollution will be the first to be attacked and handled by the legislature. It would therefore appear to be the duty of every manufacturer to do all in his power not to pollute and so give no handle for legislation. It may be taken for granted that no manufacturer can maintain a legal right to pollute any stream.

It is also a fact that a very great deal of pollution can be prevented by ordinary care in the process of manufacture. This means some expenditure, but that expenditure in most cases will lead to economy and enhanced profit in manufacturing.

The paper-makers worst polluting material is bleach, that is to say it is the most deadly chemical he uses, as far as fish life is concerned, and fish have to be carefully considered as the death of a few fish below the mill means sure trouble in Great Britain.

Before pollution got to be such a serious matter over there, papermakers were not nearly so particular in getting all available strength out of the bleach, often a test of the sludge would show 4% to 5% of chlorine, but now this is cut down to 1% to 1½%. This has been done by more care and better plant, every time the saving made has paid good interest on any proper expenditure.

This sludge was at one time allowed to run into the rivers or streams but now such a thing is never permitted. It is washed till no more chlorine can be got out of it and then run onto cheaply constructed but effective filter tanks and allowed to solidify, after which it is conveyed to the rubbish tip, unless arrangements can be made with neighboring farmers to take it away and mix with their other manure.

When boiling raw materials with caustic soda, we have another fertile source of pollution. The brown liquor or lye after boiling is not injurious to fish life unless it is very strong, but it discolors a stream badly and also makes a lot of froth on the surface. This trouble has been to a large extent overcome by the steady improvement in evaporating and recovery plants. Since the writer commenced business the percentage of recovery has steadily crept up, till now the most modern plants get a recovery of 85% to 90%. Needless to say this pays. Even if working, the best possible recovery plant there is always some discolored brown washing water to get rid of which it will not pay to evaporate. The best way to get rid of this without trouble is to have a general tank into which all the non-usable waste waters about the mill are allowed to gather; a pipe fitted with an adjustable valve leads from this tank to the stream and the valve is so set that there is continually a steady flow. The idea being to have the outflow constant and avoid a great rush of pollution when emptying a boiler or washing up machines, let it dribble away all the time, and so it will do no harm and never be noticed.

The lime used for recausticizing the recovered soda must be treated in a similar way to the bleach lime.

Other sources of pollution are the washing pulp waters and machine waters.

If one has proper pulp washing arrangements it is not advisable to re-use this water; but as regards the machine waters, every drop should be re-used that can be collected free from grease and dirt of various descriptions.

The writer is quite convinced that the mill which makes the most intelligent efforts to stop pollution will be the mill to get the largest yield from materials used and so be able to produce at low cost.

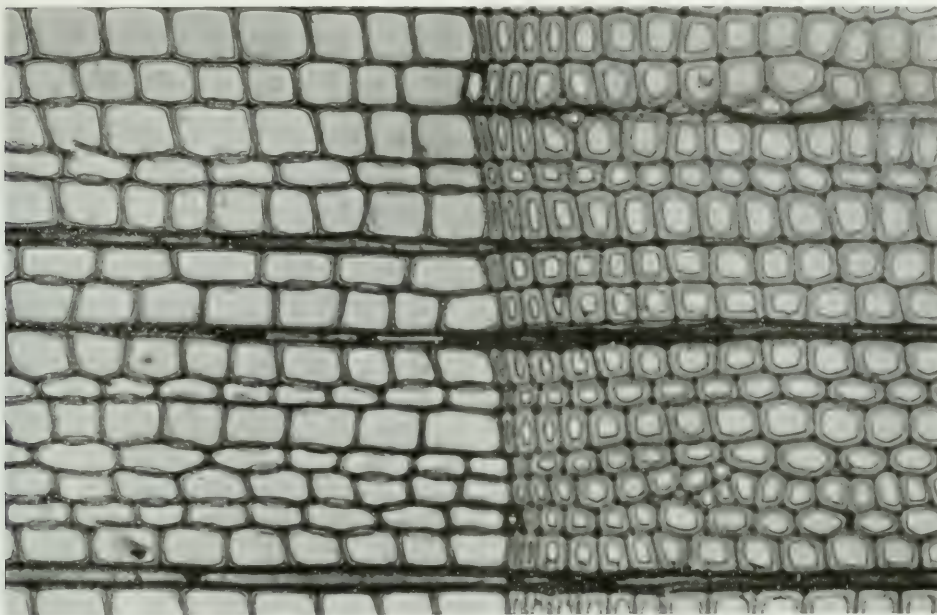
LAWSUIT SETTLED.

An action by the Ambursen Hydraulic Construction Company, Canada, Limited, Montreal, against the Dominion Paper Company, Quebec, has been settled by consent. The plaintiffs entered into a contract to construct a dam for a hydroelectric development on a 15 per cent basis, but after two months' work were stopped on the ground that the methods were too costly. The plaintiffs thereupon sued for breach of contract and for damages, and the defendants entered a counter-claim for a large amount. Under the settlement the Ambursen Company will receive \$16,000 for commission and an agreed sum for damages, the counter-claim being withdrawn.

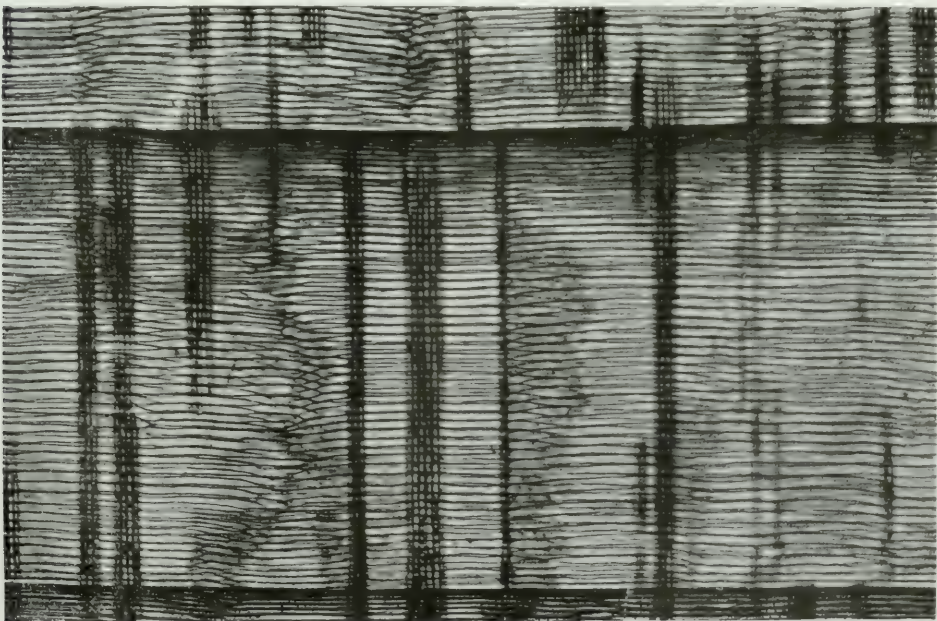
Micro. Photographs of Paper Making Woods---HEMLOCK.

Made under the direction of H. D. TIEMANS, U.S. Forest Products Laboratory, Madison, Wis.

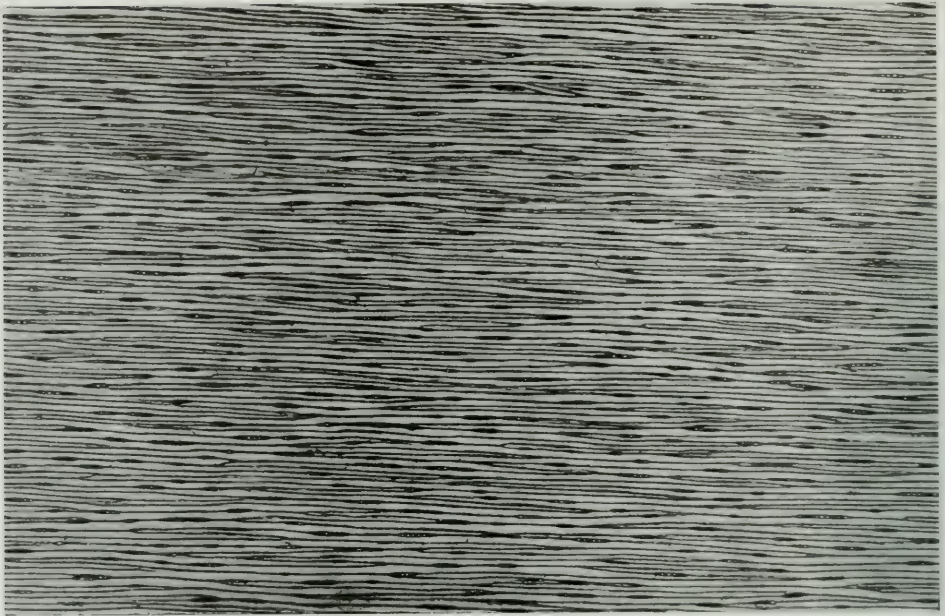
(Continued from last issue)



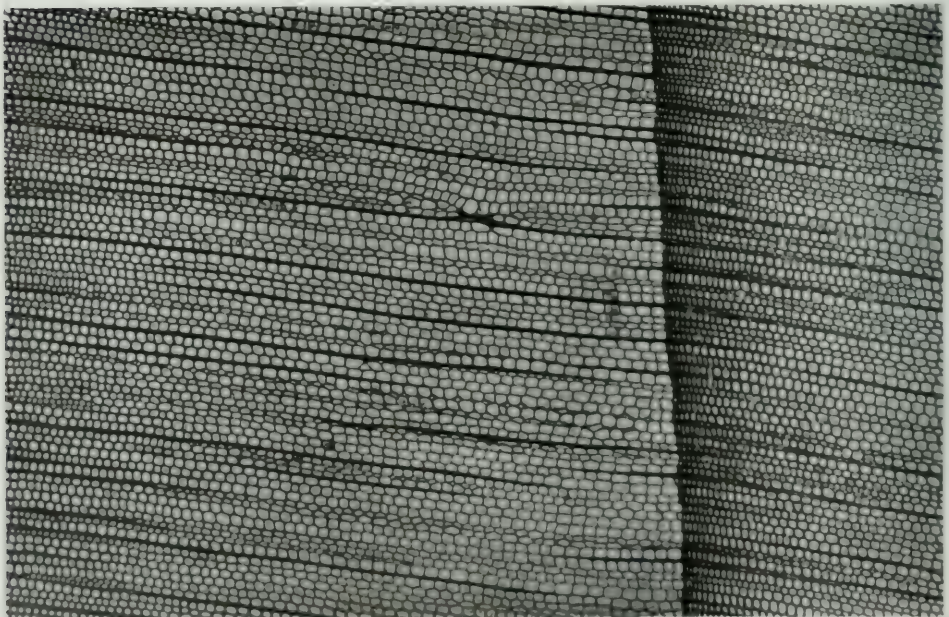
TSUGA HETEROPHYLLA Western Hemlock, X 250



TSUGA CANADENSIS—Hemlock. Radial X 50



TSUGA CANADENSIS—Hemlock—Tangential X 50



TSUGA CANADENSIS—Hemlock—Transverse X 50

THE LENGTH OF SOME PAPER MAKING FIBRES

By E. SUTERMEISTER.



HE importance of measurements of the length and width of paper-making fibres has recently been emphasized by Beadle and Stevens in an article in the "Paper Maker." This view has also been taken by C. D. Mell, who published in the "Paper Trade Journal," of June 15th, 1911, a long series of measurements of the fibres prepared from American coniferous woods. Little information relating to deciduous or broadleaved woods, is however, available and for this reason it is thought that the accompanying table may prove of interest.

All the measurements were made by means of a microscopic eye-piece micrometer which was carefully standardized by means of a stage micrometer. In each case a considerable number of fibres were measured, usually fifty or more though with some of the less important woods fewer measurements were made. The fibres were all prepared from known specimens and all were from trees large enough to be classed as of commercial size. Unfortunately no records were kept of the exact sizes or ages of the samples used except in a few specimens as noted below.

It is also to be noted that the measurements, while accurate for the samples examined, must not be understood to hold without exception for the same species throughout their ranges for it seems reasonable to suppose that the length of the fibres will be somewhat influenced by the rate of growth which in its turn is dependent on climate, soil, moisture, etc. It has also been proved by Sanio that in the case of pine the length of the fibres depends on the age of the wood and that this also holds true for poplar, and hence probably for other broadleaved woods, will be proved later.

The table below gives the maximum, minimum and average length and width of each kind of fibre studied and also the factor obtained by dividing the average length by the average width. This figure is considered as, in a way, indicative of the paper-making value of the wood since it is evident that a long but slender fibre would have greater felting power than one of the same length which is twice as broad. All measurements in the table are in millimeters, one millimeter being equal to approximately 0.039 inch.

Common Name	Scientific Name	Length			Width			L. W.
		Max.	Min.	Avg.	Max.	Min.	Avg.	
*Largetooth aspen.....	Populus grandidentata	1.63	.51	.98	.043	.021	.029	33.8
Largetooth aspen.....	Populus grandidentata	1.62	.71	1.08	.044	.020	.028	38.6
Cottonwood.....	Populus deltoides	1.36	.58	.95	.029	.014	.021	45.2
*Aspen.....	Populus tremuloides.....	1.44	.50	.95	.036	.019	.026	36.5
†Aspen.....	Populus tremuloides	1.68	.78	1.15	.046	.020	.032	35.9
Balm of Gilead.....	Populus balsamifera.....	1.18	.38	.83	.044	.014	.028	29.7
White poplar.....	Populus alba.....	1.10	.50	.93	.034	.012	.020	46.5
Chestnut.....	Castanea dentata	1.13	.38	.79	.027	.009	.018	43.9
Beech.....	Fagus atropurpurea	1.72	.70	1.13	.029	.015	.022	51.4
Cotton gum.....	Nyssa aquatica	2.67	1.24	1.85	.100	.028	.066	28.0
Sweet gum.....	Liquidambar styraciflua	2.02	.96	1.55			.031	50.0
Black gum.....	Nyssa Sylvatica	2.32	1.18	1.68			.026	64.6
Red alder.....	Alnus oregona.....	1.77	.84	1.23	.038	.014	.027	45.5
Red maple.....	Acer rubrum	1.19	.67	.93	.028	.014	.020	46.5
Sycamore.....	Platanus occidentalis	2.21	.94	1.56	.033	.015	.024	65.0
Black willow.....	Salix nigra	.98	.55	.72			.024	30.0
Paper birch.....	Betula papyrifera.....			1.17			.025	46.8
Tulip tree.....	Liriodendron tulipifera	1.59	.64	1.14			.029	39.3
Cucumber tree.....	Magnolia acuminata	1.30	.55	.86			.029	29.6
Fraser umbrella.....	Magnolia fraseri	1.47	.62	1.08			.027	40.0
Yellow buckeye.....	Aesculus octandra	.92	.46	.62			.020	31.0
White elm.....	Ulmus Americana	1.98	1.00	1.35			.019	71.0

* Tree grown in Maine.

† Tree grown in Colorado.

The question of the relationship between the size or age of the tree and the length of the fibre was studied in the case of two logs of poplar 9-inch and 3-inch in diameter respectively. From the smaller log the fibres were isolated from two positions, the heart and the outside, while from the larger log samples were taken from the heart, the outside and at a point about midway between the two. The average length and width of fibres from these two sticks follow:

	Length	Width	L. W.
3-inch log, heart.....	.49	.015	32.7
3-inch log, outside.....	.85	.018	47.2
9-inch log, heart.....	.75	.017	44.1
9-inch log, midway.....	1.00	.023	43.5
9-inch log, outside.....	1.09	.024	45.4

In a general way this confirms previous observations and proves that the fibres in deciduous woods do increase in length with the age of the tree. It does not show, however, whether this increase in length ceases at the end of forty-five years, as was proved by Sanio in the case of pine or whether it continues for a longer period.

This question is of some importance in considering the proposition to utilize the logging waste of tops and branches in the production of pulp, and leads to the conclusion that such material would yield a rather inferior product. It is also probable that some of the differences noted from time to time in the manufacture of paper may be due to the pulp being prepared at one time from small wood and at another from large logs.

Although a little apart from the main portion of this paper, yet the following measurements of fibres from cornstalks may prove of interest because of the wide publicity recently given to investigations of this material as a source of paper pulp. The pulp from corn stalks contains a large variety of fibres and cells, many of which are

difficult to describe; it may, however, be roughly divided into the following classes: (1) long fibers, (2) short fibers, (3) serrated cells, (4) pith cells, (5) large cells with cross-markings and pores and (6) smooth cells with rounded ends. Following this classification the measurements made resulted as follows:

	Length			Width			L — W
	Max.	Min.	Avg.	Max.	Min.	Avg.	
Long fibre	6.40	.92	2.01	.085	.011	.0242	83.1
Short fibre	1.32	.26	.74	.023	.007	.0143	51.8
Serrated cells	.21	.057	.113	.071	.020	.0387	2.91
Pith cells	.23	.064	.129	.156	.043	.0951	1.35
Large cells with markings	1.39	.242	.630	.157	.030	.0984	6.40
Smooth cells	.51	.101	.267	.142	.028	.0576	4.64

In considering these figures, it must be remembered that there is no very sharp dividing line between some of the classes so that the division is a more or less arbitrary one. The table does,

however, give some idea of the size of the fibres in comparison with those from woods as given above.

Making Boards on a Fourdrinier

In a translation from the "Wochenblatt für Papier-fabrikation" published in "The World's Paper Trade Review," for June 13, a description is given of the manufacture of boards on a fourdrinier without drying felts. In this way the cost of production of cheap qualities of board may be materially reduced and a softer, more absorbant and porous board is obtained. The character of the board will of course, depend first on the nature of the material and its treatment in the mill; the manipulation on the machine will also vary according to the quality. But all boards are required to lie flat, free from curling, with a smooth, uniform surface and to come evenly dried from the cylinders. This is easy when drying felts are used, but requires some attention when working without them.

The stuff must come on the wire with plenty of water, the wire must be long, and the shape strong. The water should be carried as far forward as possible and then drained quickly out just before the couch roll. For this purpose it is desirable to run the stuff a little warm, say at 95° to 100° F. For making boards of a thickness of one millimetre without felts a top wire is an absolute necessity. The top wire is given an effective traction in contact with the stuff for a distance of about eight feet, and is pressed against the web by means of three or four small rolls which are loaded with weights so as to give an increasing pressure as the web moves forward to the couch press. This arrangement gives a well closed even top surface to the board and insures a uniform draining.

With strong boards one or two suction boxes may be used, but they must not suck too strongly, otherwise the surface of the thick wet web will become uneven. Strong boards should be pressed up hard in the presses, while with soft boards the pressure must be very light or even missed altogether. Even heavier boards are far more easily dried without felts than boards from wet milled stuff, and

the latter, if not pressed as dry as possible, will tend to buckle and cockle on the cylinders, a tendency which is never experienced with freer stuff. When in the case of a soft board the web is allowed to miss the presses and to pass straight from the couchers to the cylinders, no wet felt is employed, but the heavy wet board is supported by a number of small wooden rollers about 2½ inches in diameter, arranged close together like the tube rolls which support the machine wire. They are arranged on an upwardly inclined plane leading from the couchers to the top of the first cylinder, where the board is gripped by a larger metal guide roll. This runs in spring bearings which press it with moderate pressure against the cylinder so that the wet board is held and drawn. Around the first cylinder are arranged two or three further adjustable pressing-on rolls, keeping the board against the surface of the cylinder and at the same time acting as smoothers.

In the case of very heavy boards it is advantageous to employ an endless band of cheap gauze arranged around the first cylinder only, after the manner of a drying felt. The gauze should be only moderately tensioned, serving only to support the board, not to press it. With heavy boards this gauze may be extended to enclose the small wooden supporting rolls mentioned above and help the board up the slope.

The use of wire cloth instead of felts has not proved satisfactory. The wires have a tendency to kink unless they are stretched very tight, they also show a tendency to leave a mark and work out much dearer than the gauze which is recommended. The other cylinders are used perfectly bare and are each provided with two pressing-on rolls for leading the board on and off. The pressing-on rolls of the earlier cylinders should be provided with doctors to keep them clean.

Considerable attention must be paid to the draw of the cylinders. Between the earlier cylinders also, carrying rolls will be required while the board is still wet in order to avoid breakages under its own weight.

Collodial Chemistry and Papermaking.

Writing in a recent number of "Wochenblatt fur Papierfabrikation," Professor P. Rohland of Stuttgart, states:

Between colloidal chemistry and paper-making, so many and such varied connections exist, that it seems remarkable that the fact should not have been recognized until within a recent period. But many troubles have been recognized of late that were not realized formerly, or only to a limited extent. For instance, paper-makers, have been greatly troubled of late by a notable hardening of river waters and subterranean streams, especially in neighborhoods where the water is contaminated by the refuse liquors of potash works. These waters contain exclusively salts, including a large proportion of magnesium chloride. Water thus hardened interferes with the sizing of paper, and must first be purified. The salts it contains act as electrolytes, and coagulate or throw down the sizing substances.

As a large proportion of electrolytes is injurious to sizing, the latter is rendered more effective by the presence of kaolin and tales, by the latter especially, which are colloid promoting substances, that is, they form colloidal substances with water or hydrogen or hydroxyls, there being produced hydroxides of silicon, aluminium or magnesium; a flocculent separation of the substances occurs, in connection with an increase of volume, and in this condition the kaolins and tales have the property of combining with the sizing substances, casein, starch, dextrin, etc., to form colloid aggregates.

As regards colloids, the general principle prevails that colloid substances unite with others of the same kind, to form colloidal aggregations. Not all kaolins have, in the same degree, the faculty of forming colloidal substances and of uniting with other colloids to form aggregations. Those are to be prepared, which in addition to great whiteness display a high degree of plasticity; for these, too, are conditional on the volume of colloid substances they contain.

The property of tales for absorbing rosins, fats and oils, makes them well adapted for the deresination of cellulose. The tale suspended in hot water may be added to the cellulose boiler arranged for washing, or to the beater. The production of a tale suspension in hot water is advantageous, because, in this, by hydrolytic methods, a greater development of the colloidal bodies from the tale takes place. The tales are excellent deresinating and degreasing media. They are likewise particularly suited for use as loading material, their adhesion to paper being very great. In moderately thick paper, 85% will remain in the paper substance, whereas of kaolin but 50% will be taken up.

On a colloidal chemistry basis, a point of difference between the various loading substances can be established. These may be either crystalloid substances, like heavy spar, gypsum, carbonate of magnesium, or substances of a colloidal character, such as kaolin and tale. The first-named have not the capacity for the absorption of coloring substances of a complex character, whereas the latter do possess this. This investigation can best be

conducted with aniline dyestuffs, aniline blue, for example, by which it is possible to establish a precise differentiation between both kinds of substances.

In addition to oils and fats, kaolin and tale, by reason of their colloid structure, absorb coloring substances of complex composition, both inorganic and organic in character; of the inorganic, for instance, Berlin blue, because this is of complex composition; also the long list of aniline colors, animal coloring substances like carmine, vegetable coloring substances like orseille, etc.

These absorptions are based on the following processes: Kaolin and tale, in an air dry condition, possess, to a certain extent, in a latent state, colloid substances and develop them in association with water. Thereby numerous demarcation and terminal surfaces are formed against the absorbing fluids that are the seat of superficial energy and in which surface expansion and capillarity are active.

If we desire to draw a picture of this absorption we can imagine that in the closely reticulate colloid tissue, the large molecules, complex in constitution, of the coloring substances, the fats, oils, etc., are absorbed, held back and retained. In connection with this is the notable light resistant character of tale and kaolin colors; the coloring substances enclosed in the small-cellular colloid tissue are surrounded by this as by a protective covering, so that the destructive effect of the rays of light is weakened and neutralized. This light-fastness is beneficial to the whiteness of the paper and protects it against yellowing.

These absorptions, which the author first discovered in tales from Upper Austria, are of great importance in paper-making. Such tales are almost perfectly pure, only, in them, the chemically fixed hydrogen is replaced by magnesium and aluminium. Their analysis showed the following composition:

Si O ₂	61.85
Mg O	34.52
Al ₂ O ₃	2.61
H ₂ O (Chemically combined)	0.60
Fe ₂ O ₃	0.25
Ca Co.	Traces

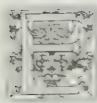
The colloid clays and tales serve to purify the waste water from paper mills. These colloid clays absorb, in addition to colloid dissolved substances and coloring matter of complex composition from carbonates and acid carbonate salts, the anions completely and the same from borate salts, but only partially from phosphate salts. With this there occurs, simultaneously, an exchange of the alkalis of the solution for the earth alkalis in the clays.

Furthermore, these clays absorb strong odors and such as are offensive, proceeding from substances present in such minute quantities that they can not be quantitatively determined. It is remarkable that the flat, characteristic clay odor is communicated to the water solution, etc., in contact with the clay. Finally colloid clays take up from the water unsaturated carbohydrates of the composition: $C_nH_{2n}CnH_{2n}-2$, wherein probably no absorption but a chemical fixation occurs.

The Canadian Handle Merger factory at Strathroy, was destroyed by fire last week with a loss of one hundred thousand dollars and throwing about one hundred men out of employment.

Utilization of the Wood-Substances Contained in Sulphite Waste Lyes as Fuel and Reclaiming of the Sulphurous Acid and Lime Used

By R. W. STREHLENERT



VERY sulphite engineer probably since the beginning of the sulphite industry desires to be able to utilize the waste lye from the mill, which contains in solution more than one half of the weight of the wood.

Every sulphite engineer also knows very well, what valuable substances are eliminated during the digesting of the wood, and the problem of utilizing them as fuel for the mill evidently is close at hand. The most combustible contents, namely, rosin, oil, fat, lignine and miscellaneous carbo-hydrates, are substances, upon which the caloric effect of the wood to a ceratin degree depends. All this is eliminated as completely as possible during the digesting process, in order to obtain the cellulose of sufficient purity. These substances, which amount to 2% or at the most 13% of the waste lye, are dissolved in a quantity of water of about 10 cubic meters (2640 gallons) per ton cellulose. The easiest way to reclaim them seems to be by evaporating the lye, and numbers of patents have been applied for on methods and apparatuses for this purpose. It, however, remains a fact that about 9,000 litres of water have to evaporated before the dissolved substances are available.

The residue is a tough, viscous substance, which is difficult to handle and has only a low caloric effect, as it contains in different combinations, all the sulphur and lime in the acid. This evaporation process will be expensive even under most favorable circumstances. Many German sulphite mills, which on account of their location, some years ago, were obliged to make their waste lyes harmless, evaporated it, but could not stand the costs and must shut down.

Most of the many patents applied for are based on this very unsatisfactory and uneconomical system, always however, with the exception of some patents on methods to reclaim certain ingredients in the lye, which have had more or less success, and especially with the exception of the latest Swedish methods to utilize the fermentable carbo-hydrates for the manufacture of alcohol.

The author had a considerable experience in the sulphite industry before taking up this problem. He began his work without having studied the patent literature as he thought, that already known methods would lead him on along roads which it would later be difficult to abandon. He started with the intention, that the forces which should be used for solving the problem, ought to be looked for in the lye itself, and that as little outside forces as possible should be used.

In the lye exist, as we know, residues of free SO_2 and also combined. The last-named, the combined SO_2 , is combined with the lignine from the wood. The quantity of SO_2 which may be at hand as sulphuric acid, is minimal in comparison with the combined SO_2 . It was this circumstance that inspired the author to solve his problem. He oxidizes the free SO_2 in the lye to SO_3 , and the stronger acid thus formed, the sulphuric acid, drives out

the weaker sulphurous acid from the lignine complex, or the so-called ligno-sulphinate of lime. This substance is soluble in water but the lignine is insoluble. Consequently the lignine must be precipitated, if the SO_2 is driven out of the combination.

In order to oxidize the free SO_2 in the lye, the author used a scientific fact, already well known, namely, that SO_2 under high pressure and at a temperature of about 170°C ., in presence of oxygen or air is oxidized to SO_3 .

The method and apparatus used for the first experiments was very simple; an autoclave constructed for a working pressure of 300 lbs., and compressed oxygen which could be admitted at any pressure. For the first experiment the author used by an happy accident sulphite lye from the Lilla Edets sulphite mill. This lye was obtained from digestion, where direct steam was used, i.e., from easily bleached pulp, and combined up to 14% to 15% of solid substances. The percentage of free SO_2 is only about 0.01%, but experience has shown, that the organic substances are precipitated easier the higher the concentration is. This is, however, not to be regarded so, as if the facility, with which a precipitation is effected, is directly proportionate to the concentration of the lye; instead the rapidity of precipitation increases immensely more rapidly for a lye containing 1% more of dissolved organic substances, than for a lye with 1% less. The percentage of free SO_2 can also be very much lower.

Already the first cook gave an astonishing result. When the cover of the autoclave was lifted up, a solid, gelatinous mass was found. The lye was eliminated by means of a centrifuge, the substance was dried and weighed, and it was found, that 90 grams of solid substance had been obtained per litre of lye, corresponding to 900 kilo. per ton of manufactured pulp. The pressure used during the experiment was 300 lbs. and the temperature 190°C . Several cooks were used; all with equally satisfactory results. The author then experimented with lye from strong cellulose, i.e., cellulose cooked with indirect steam. The percentage of solid residue after evaporation of the lye was here considerably lower, about 10% to 10.6%. The percentage of free SO_2 , however, was higher, about 0.1% or somewhat more. The temperature must be raised when cooking of this lye, 200° to 210°C . were used, and equally favorable results were obtained, even if a somewhat less solid substance remained. The time of cooking or rather breaking up varied between 40 minutes and one hour.

The author began to use air instead of oxygen after having continued the experiments daily for about two months. The result here was still better. The precipitated organic substance had not been so strongly attacked, or rather the formation of sulphuric acid was not so rapid, on account of which the final product was less charred. It was found, that the cooking easily could be handled so

that a nearly pure, uncharred lignine substance could be obtained. In the practice it is possible under normal conditions to regulate the cook so, that a substance of desired qualities is obtained.

When the lignine substance, obtained during the first period of the experiments was tested for fuel purposes, it was found that the percentage of ashes was rather high. The lime salts, remaining in the substance were the cause. The author then tried to find a simple method to eliminate this and found sodium bisulphate very suitable. This salt is obtained as a by product from several chemical industries and is very cheap. The sulphite is added to the lye immediately after it leaves the digester, in quantities varying according to the percentage of lime in the lye, usually about $1\frac{1}{2}\%$ to 2% . The reaction takes place nearly immediately. The lime is precipitated as gypsum and is substituted by soda in the lignine complex; i.e., a ligno-sulphinate of sodium is obtained, instead of the lime soda. The advantages are easily understood. The sodium salt, being soluble in water can be washed away after the precipitation of the lignine substance. An end-product with a very low percentage of ashes is thus obtained and the caloric value of the product is thus increased.

The following is a short description of the method of proceeding.

The hot lye from the sulphite digester is precipitated with sodium-bisulphate; the gypsum which is precipitated, is given time to settle and the clear solution is run into the autoclave. The gypsum is washed in a centrifuge and is ready as a merchandise after drying. The autoclave, filled six tenths full with precipitated lye, is closed and heated to 100°C . Air is then pressed in to a pressure of about 28.5 lbs. A reaction temperature of about 20°C . is noticed during this period. The heat is then slowly increased until a temperature of about 160° has been reached. The SO_2 was then found to be oxidized up. The critical temperature or the point where the lignine substance begins to become disassociated, is between 160° and 170° . The heating can then be very considerably forced, and an addition of heat from the chemical reaction of about 20°C . will be noticed also here.

The cook is ready, when 200° or somewhat more has been reached, which for a normal cook, ought to be 40 to 60 minutes after the temperature in the digester has been found to be 100° . The following is, however, to be remarked. When the critical temperature is reached, i.e., when the disassociation begins, the pressure increases so rapidly in the digester, that a blow off valve on the autoclave cover must be opened. Most of the free SO_2 is thus let out, which can be collected and used again. The addition of temperature which has been obtained in this autoclave is utilized by blowing into a second autoclave, which thus always must work alternately with the first. A weak current of air is blown through the lye during the second moment of the heating up period. This has been found indispensable in order to get a precipitate of an easily treatable consistence. The precipitate becomes somewhat gelatinous with too little air, and with too much air it is oxidized too sharply; an average is, however, easy to find here. The excess of air pressed into the first autoclave, is conducted to the second and thus nothing is lost. The cover of the first autoclave is opened and the mass emptied out, when the temperature in No. 1

has been reduced to about 100° and consequently, there is no pressure. A precipitate of a sandy character is obtained which easily can be washed free from excess of water in a centrifuge, provided that every thing has been right during the heating up period and that enough air has been blown through.

A correctly treated precipitate is easily freed from an excess of water in a few minutes in a centrifuge to at least 50% dryness.

The product can then easily be dried to any desired degree of dryness. The dry product has a caloric effect of about 7,000 calories calculated in substance free from ashes. The percentage of ashes can, as above stated, be reduced to an exceedingly small percentage of the weight of the raw material. At least 30% of water ought always to be left in the substance, partly because it burns too vehemently if completely dry and partly because it then leaves considerable as dust.

Preparation of Caustic Soda from Silicate of Soda

Many attempts have been made to prepare caustic soda from water-glass by the action of lime, but the difficulty has always been that the silicate of lime also formed is in the gelatinous form, and so entangles the caustic soda that it is impossible to laviate it out.

The only way hitherto known of combating this difficulty has been to dry the whole mass after the re-action. This operation has two very serious drawbacks, either of which is fatal. One is the expense for fuel, the other is that unless the greatest care is taken in the drying, especially to do it very slowly and at the lowest possible temperature, an insoluble glass will be formed, consisting of a double silicate of lime and soda, from which no soda can be dissolved out.

M. L. P. Basset claims to have discovered that if the mass of gelatinous silicate of lime and caustic soda is simply left to stand for twenty-four hours after the reaction, the silicate becomes non-gelatinous, and the soda can then be easily dissolved out. The silicate of soda is taken at about 30°B . strength, and mixed with quicklime. Slaked lime may be used, but then the silicate must be stronger, say, 45° to 50°B . It is, however, much better to use quicklime and the less concentrated silicate.

The best method of preparing the silicate of soda for the purpose of making caustic soda is to pass steam over a red hot mixture of sand and common salt. The amount of sand required per 100 pounds of salt depends on the fineness of the sand, being less as that is greater. If the sand is ground as fine as flour, from 60 to 80 pounds of it will be enough. If the sand is coarser, as much as 200 pounds may be wanted.

The furnace used is a rotating one, heated internally by burning a spray of oil or coal dust. The silicate of soda formed is not vitrified unless the temperature has exceeded 900°C ., but in any case it dissolves in water with the greatest possible facility and speed. The hydrochloric acid formed in the preparation of the waterglass is condensed in a tower of the usual construction.

The Paper and Pulp Industries in Russia.

By C. E. BANDELIN.

The demand for paper in the world's market has risen immensely during the last ten years and the paper industry has consequently been intensely developed. The times are long ago gone, when the main raw material for the manufacture of paper consisted of rags. At the present time nearly exclusively wood-pulp is used, except in Russia, where notwithstanding the great resources of wood, none or at least a very slow development in the wood pulp industry can be perceived. During the last fifty years there have been built in that country: 1860 to 1869, six mills; 1870 to 1879, twelve mills; 1880 to 1889, eighteen mills; 1890 to 1899, twenty-nine mills; 1900 to 1910, seven mills.

This is, however, erroneous in so far as the last seven mills are very large and also because several of the already existing mills have afterwards been enlarged, but it is still evident, that the paper industry is only slowly being developed in Russia. This industry ought, however, to be especially lucrative in Russia with its rich resources of raw material. This can, however, now not be said to be the case, as according to a report of 1910, the average income for twenty-seven mills was given as only 4%. The reason is to be found mostly in deficient planning of the establishment and faulty calculations, old machinery and competition with the rich Finnish resources in paper and pulp. The raw material has up till now been rags, and wood-pulp has just lately been brought in the market, so it can be said, that the manufacture of paper from it is only recent and consequently has not as yet been much developed, especially with regard to the chemical pulp.

It seems as if the building of paper mills ought to be natural in regions where there is plenty of wood, especially in the provinces of archangelsk, Olonetz and Wologda, where the area of forests belonging to the government amounts to about 163,000,000 acres, and where, especially as in the Olonetz district, also waterpower is at hand, even if the head is not very high. Mills occur, however, only occasionally in these provinces on account of the distances being too great and on account of the lack of communications. This is the reason, that there are mills in such provinces as Orel and Tchernigoff, where there is little wood, but where the communications are better. The lack of mills in the wooded provinces depends not only upon this, but also upon the competition with Finland and further upon lack of enterprise. The new mills built are also usually financed by foreigners.

One reason for the slight developments of the paper industry in the wooded districts may be found in the circumstance that the government owns 80 to 90% of the forests in the provinces mentioned, while in other provinces, as for instance in Livonia, about 85%, are owned by communalities or private owners. One reason is also, that the Russian paper-mills usually are built too small to stand the general expenses.

It is mainly two concerns in Russia, Waldhof in Pernau and Sokol in Wologda, which dominate the paper market.

The number of wood-pulp mills in Russia is only about seventy. The mills are mostly located

in the northern and western provinces. The greatest number, twelve, are in Livonia, and secondly in the provinces of Novgorod and Volhynia. The number of mills making only wood-pulp is about twenty with an average production per year in the value of about \$2,000,000 and with about 2,500 laborers.

About 20,000 tons of cardboard are made in twenty-six mills. About 60% of the Russian cardboard and paper is made of foreign pulp. There ought to be more than 100 mills and many thousands of laborers, if the paper pulp was made in Russia. On the other hand Russia exports considerable quantities of pulp-wood and this export is steadily increasing.

The following data may be given regarding different grades of paper:

Coarse papers, wrapping paper (usually rather coarse), is mostly made in the country.

Fine writing paper comes from France or Germany; copying paper is usually of domestic manufacture.

Colored, thin papers come from Austria. Paper for type-writers comes from Germany. Letter paper and envelopes are domestic, but better grades come from foreign countries.

View cards come from Germany and Sweden. Cigarette or papyross paper is usually made in Russian mills. The consumption is considerable, but the public makes their cigarettes themselves and uses often for this purpose, newspaper or any old kind of paper.

Finland exports considerable quantities of cigarette paper as well as wall paper.

The import to Russia is increasing: 50,000 tons valued at \$6,500,000 were imported in 1905; 64,000 tons, valued at \$8,000,000, in 1906; 76,000 tons, valued at \$8,500,000, in 1907; 80,000 tons, valued at \$8,500,000, in 1908; 82,000 tons, valued at \$10,000,000, in 1909 and 100,000, valued at \$12,000,000, in 1910.

Most of the import of course, comes from Finland. The Finnish import was: 1907, \$6,500,000; 1908, \$7,000,000; 1909, \$8,500,000; 1910, \$9,500,000.

Cardboard, wrapping paper and roofing board especially are imported from Finland in an increasing ratio.

The import of paper from other countries is also increasing.

Russia exports cellulose and rags. The export of cellulose however, is not very considerable and is nearly stagnant. Russia exports unbleached cellulose and imports bleached. The price for both is falling. In 1910, 0.87 rubles per pud was paid for export pulp and 1.50 rubles for import pulp, this on account of improved methods and the general developments of the industry.

A meeting of the hemlock lumbermen of Ontario was held in Toronto last week at which H.H. Carter presided. It was decided to draw the attention of the Ontario government to the vast importation of southern pine which is being made into Canada at the present time and the government will be asked to use the Canadian wood exclusively on public works. It was declared that even the cutting and storing of this imported wood was inferior to the local growth and that Canadian hemlock, which had been in use for over sixty years, was in first class condition today.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The Racquette River Paper Company of Potsdam, N. Y., was the host at a banquet given to thirty-two of its employees at Arlington, N.Y., on Saturday evening, January 3rd. The affair was in the nature of a New Year testimonial, and may be repeated next year. Those present included the officers and the various department leaders, together with Arthur C. Hastings, president of the American Paper and Pulp Association as guest of honor. Mr. Hastings made an impromptu address and spoke on the general state of the industry, and in particular of the foreigners' application of science to the paper business. He concluded by explaining this country's conservation of its natural resources which are such important factors in the pulp and paper industries.

Information has been received in Northern New York that the Donnacona Paper Company, Ltd., the new concern in which a number of business men in that section are interested, will probably be in operation next month. As the originators of this proposition are men of large affairs, and have been able to carry their operations forward without the general sale of securities to the public, little has been made public of their intentions. It is understood, however, that they have obtained large blocks of lumber in Canada, and have built their mill on a very favorable site on the St. Lawrence River. The underlying feature of the proposition is that with the diminishing supply of lumber in this country, and particularly in Northern New York, it is advisable to anticipate by a few years the natural results of such a process, and by being forehanded in placing their mill next to the actual supplies, and to reap the benefits accordingly.

Manufacturers and publishers have gone to extremes in adopting light weight printing paper for their publications, asserts the Department of Agriculture at Washington through its leather and paper laboratory. In a statement just issued, the Department warns against the use of light limp paper in publications which are consulted very frequently, as it is unsuitable for the purposes for which it is employed, and wears out much too fast.

After twenty three years of service, William Brown, of Glens Falls, N.Y., has resigned as foreman for the International Paper Company, to accept a place as assistant superintendent of a mill owned by the News, Pulp and Paper Company, Ltd., in St. Raymond, Canada. This mill is said to be one of the largest in North America. Mr. Brown entered the employment of the International Paper Company as a paper-maker and gradually rose to machine tender and then foreman.

F. L. Holt has resigned his position as superintendent of No. 1 Mill of the Nashua Gummed

and Coated Paper Company, of Nashua, N.H., to enter business for himself in the West. Mr. Holt has been identified with the company for the past ten years. His resignation is effective February 1.

The Hallingworth and Whitney paper mills at Winslow, Me., are constructing an acid tower and making an addition to the sulphite mill. Horace P. Winston Company, of Waterville, are the contractors. The work will be completed in March when it will be necessary to add 125 men to the working force.

The Strathmore Paper Company has completed sit new \$500,000 mill at Woronoco, Mass. The structure is built on the unit plan and is of reinforced concrete. Power for the mill will be furnished by the hydro-electric station on the Westfield River and from a nearby steam plant. The Company has also erected seventeen houses which have tenements for fifty-three families.

It is understood that the Plainville Paper Box Company, of Hartford, Ct., will shortly ask for receivership proceedings so as to wind up the company's affairs. They have been closed by attachment for sometime and it is thought they will discontinue business. As soon as the affairs of the Company are straightened out, Manager John Lyon will leave the city, as he has received several very remunerative offers elsewhere.

The Whitaker Paper Company, of Cincinnati, Ohio, held its tenth anniversary sales meeting several weeks ago. On this occasion addresses were made on all subjects of interest to the trade by the managers of the various departments. Representatives from each of the company's sixty-five branch houses were in attendance. The committee in charge of the affair were: A. L. Whitaker, president; D. E. Barry, vice-president; H. Junginger, Jr., treasurer; and H. P. Warrenner, secretary and general manager.

Following the lead of the International Paper Company in the east, it is stated that a number of the Western manufacturers of newsprint paper have decided to materially reduce the production of news in Wisconsin, Michigan and Minnesota during 1914. Most of the manufacturers, it is said, will switch to other grades as far as business will permit. Canadian competition is given as the chief reason for the news manufacturers in this country leaving the field. Low prices following in the wake of the heavy competition from across the international border, made possible by the Canadian reciprocity act, is evidently driving American mills out of the newsprint market.

Fire in the heart of the business district on January 6th in Philadelphia, Pa., swept the five-story envelope factory of Charles J. Cohen &

Sons, Fifth and Ludlow Streets, entailing a damage of \$100,000 and causing serious injury to four firemen. The fire was probably raging for some time before it was discovered, as it was concealed by the exhaust of a near by power house.

* * *

Assistant secretary of the Treasurer Hawlin, at Washington, on January 6th, wrote the Collector of the Port of New York as follows, regarding the proper classification of wrapping paper:

"The Department is in receipt of your letter of the 9th ultimo., presenting for consideration and decision the question whether wrapping paper with a surface design is dutiable under paragraph 324 at the rate of 35 per cent. ad valorem, which paragraph provides that rate of duty upon papers with the surface or surfaces wholly or partly decorated or covered with a design, fancy effect, pattern or character, whether produced in the pulp or otherwise, or under paragraph 328 of the said act at the rate of 25 per cent. ad valorem, which paragraph provides that rate upon wrapping paper not otherwise especially provided for.

"The United States Court of Customs Appeals in T. D. 33,221, held that certain merchandise invoiced as 'white glaze wrapping paper,' imported under the tariff act of 1909 and which the appraiser reported consisted of 'super-calendered, grease-proof paper, known as glassine, or parchmyn paper,' was properly dutiable under paragraph 411 of the said act at the rate of 2 cents per pound and 10 per centum ad valorem, and not as claimed by the importers under paragraph 415 of the said act as 'wrapping paper not specially provided for.'

"That portion of paragraph 411 under which the court held the papers dutiable provided for parchment papers and grease-proof and imitation parchment papers which have been super-calendered and rendered transparent or partially so by whatever name known.

"The court in this decision stated that the specific enumeration in paragraph 411 took precedence over the general classification of wrapping paper not specifically provided for in paragraph 415, and following the reasoning of the court the Department is of the opinion that the provision in paragraph 324 for papers with surface or surfaces wholly or partly decorated or covered with a design, fancy effect, pattern, or character, whether produced in the pulp or otherwise, is more specific than the provision in paragraph 328 for wrapping paper 'not specially provided for.' You are accordingly directed to classify merchandise of this character under paragraph 324 leaving for the importers if dissatisfied their remedy by protest."

* * *

The purchase of the Ocean Falls Pulp & Paper Company by a San Francisco Syndicate, headed by William Pierce Johnson and Herbert Mortimer Fleishacker has been announced. The Ocean Falls Company is to be reorganized, and it is proposed to combine the chief pulp and paper interests on the Pacific Coast on both sides of the international boundary line. The proposed amalgamation will unite the Ocean Falls Company with the Powell River Pulp & Paper Company of British Columbia, now in operation, the Crown Paper Company of Portland and Quatsino Sound Pulp Company.

* * *

The pulp, Scituate and Paper Mill Workers' Union at Little Falls, N. Y., has elected the follow-

ing officers: President, J. Murphy; vice-president, Philip Kuss; treasurer, M. Daley; financial secretary, C. W. Bennett; recording secretary, D. McCombs; guide Daniel Sedgwick; trustees, L. Linehan, Clayton Philo and Fred Reynolds.

* * *

The industries of Dkowhegan, Maine have acquired a new kind of a factory, the manufacture of paper in the finished product from the waste of woolen mills, old papers, old rags and many other kinds of waste materials. This business is now being carried on by the Savage Manufacturing Company and twenty-six hands are at present employed for the work. The mill was started by E. L. Savage as a ground pulp mill and the present product makes the mill making fourteen grades and contemplates making more. His plans are to triple his present output and orders demand it as soon as he can get the machinery being made for him. The paper he now makes is used largely in the manufacture of pasteboard boxes.

* * *

Logan Thompson, son of Peter G. Thompson, President of the Champion Coated Paper Company, Hamilton, Ohio, narrowly missed being struck by a large piece of iron several weeks ago when workers dynamited the wreckage of the Black Street Bridge, at present imbedded in the Miami River, having been wrecked by the flood. The iron flew across the channel and into the office of Mr. Thompson, striking his chair.

* * *

Orin Earl, of the firm of Earl Brothers, loggers of Peshtigo, Wis, says that conditions are quite unfavorable for logging owing to lack of snow. He declares that some of the pulp companies whose plants are entirely out of raw stock have issued orders to their crews in the woods that unless snow occurs at a very early date wagons must be employed for hauling logs. They simply must have pulpwood especially spruce, and if sleighs can not be used, loggers must resort to the more expensive method and haul the wood on wagons to railroad sidings. Inasmuch as from two to four weeks of the normal season in the woods is already passed it is plain to be seen where at best the output is bound to be small this year. Not in many years have pulp mill yards been as depleted as they are at the present time.

Secretary of War Lindley M. Garrison, as a stockholder of the St. Gabriel Lumber Company of Canada, lost on January 3rd, by a decision of Supreme Court Justice Davis in New York City, a suit against Howard W. Durant and the banking firm of Sheldon & Co., to recover 67,000 dollars. Durant was alleged to have received the money as a secret commission from the Sheldon firm and the Union Bag and Paper Company on the sale of assets of the St. Gabriel Lumber Company to the Union Bag and Paper Company.

Secretary Garrison testified at the trial that he went into the lumber business with Durant in Canada, in 1902, and that in 1908, because of the failure of the Sovereign Bank of Canada which held liens of the St. Gabriel Lumber to the extent of \$100,000, the lumber company was on the verge of insolvency. Durant then suggested that the company sell out to the Union Bag and Paper Company. Secretary Garrison and other stockholders contended that Durant made a secret profit of \$67,000 on the deal.

Ottawa Notes.

(Special to the Pulp and Paper Magazine.)

Ottawa, Ont., Jan. 12th, 1914.

The new sulphite mill being built by the J.R. Booth Company as an addition to its present plant for the production of sulphite pulp is fairly well advanced toward completion. The machinery will all be in within the next month and it should be ready for operation in February or March.

The new groundwood mill which the E. B. Eddy Company recently finished will also be operating at full capacity by February. Men are now at work on the power plant of the Company, which is being rearranged to increase the power supply.

The Railway Commission yesterday gave judgment refusing the application of the Howell Company of Toronto, protesting against the increase in freight rates on import wood pulp to various points on the C. P. R., G. R. T. and Canadian Northern. It was stated that in 1912, the C. P. R. and the Canadian Northern had a rate of 6 cents per 100 pounds on this commodity, in carloads, from Montreal to Shawinigan Falls while as the same time the C. P. R. rate to Grandmere, Joliette and Lachute was 8 cents per 100 pounds. To Kingsey Station and Windsor Mills, the Grand Trunk rate was 9 cents. As a result of the negotiations between the applicant and the railways, the C. P. R. rates to the points mentioned were reduced to 6 cents per 100 pounds while the Grand Trunk reduced its rate to Windsor Mills and Kingsey Station to 7 cents. The railways gave notice these rates were limited to 1912 and later restored the rate to 8 cents to Shawinigan Falls.

The two companies most vitally concerned in the application were the Belgo-Canadian Pulp and Paper Company at Shawinigan Falls, and the Canada Paper Company at Windsor Mills, to both of which the Howell Company sells sulphite pulp. In its judgment the Railway Commission states that consideration of the tariffs on wood in force between other points on the Grand Trunk shows that they are not worked out on a mileage basis, as is indicated by the following rate comparisons:

	Miles	Min.
	40,000 lbs.	
Danville to Cornwall	154	8 cents
Ottawa to Brompton Falls	208	8 cents
Merrittton to Georgetown	61	6 cents
Hawkesbury to Cornwall	67	6 cents
Merrittton to Thorold	69	6 cents
Campbellford to Toronto	125	7 cents
Ottawa to Mille Roches	113	6 cents

The judgment also points out that it is shown in a statement submitted by the Grand Trunk that there are at Montreal special charges amounting to about 2½ cents per 100 pounds, as follows: handling, 30 cents per ton; rail carriers' proportion of wharfage, 3 cents per ton; Montreal Harbor Commissioner's switching, \$2.50 per car, 17 cents per ton, making a total charge at Montreal terminals of 50 cents per ton. It concludes: "Comparing the rate as charged with the rates of the local product and taking into consideration the mileage involved and the charges which have to be borne at Montreal on the imported product as compared with the movement on the local product,

the Board is of opinion that 8 cents is a reasonable rate for the movement from Montreal to Windsor Mills."

A fact that has been widely commented on has been the fact that out of six Canadians who figure in the New Year's honor list from London, announced on the first day of the year as usual, no less than four of them are men who have either been engaged in the actual manufacture of timber into its various products or have been associated at one time with the industry in a legislative capacity.

Henry K. Egan and Hon. Lt-Col. Sir Douglas Cameron are the two lumbermen honored. Mr. Egan, hereafter to be known as Sir Henry Egan, is an Ottawan and is managing director of the Hawkesbury Lumber Company. Sir Douglas Cameron, who is accorded a K.C.M.G., is lieutenant-governor of Manitoba and is known to the lumber trade as president and general manager of the Rat Portage Lumber Company which has mills at Kenora, Norman and Rainy River, Ont., Winnipeg and Vancouver. Besides these men, Sir Francis Langelier, lieutenant-governor of Quebec and formerly known to lumbermen as minister of Crown Lands for the same province, is also a K.C.M.G. while Mr. Aubrey White, formerly engaged in the lumber business in Muskoka and at present deputy minister of lands and forests for Ontario, is made a C.M.G.

A question of considerable interest to both Canadian and United States lumbermen and paper mill owners will be discussed in Parliament during the coming session—that of the pollution of international streams. A commission appointed to investigate this question has prepared its report which will show, it is understood, serious pollution of various international streams along the boundary. The carrying on of lumber operations and the discharge from paper mills are among the sources of pollution dealt with in the report, it is understood.

An order-in-council has been passed by the Cabinet along the lines of the recently announced policy of the Government with regard to water powers on Dominion lands. The order-in-council amends the regulations governing the granting of yearly licenses and permits to cut timber on Dominion lands in Manitoba, Saskatchewan, Alberta, the Northwest Territories and certain portions of British Columbia so as to provide for the withdrawal from timber berths held under license, of lands required for waterpower purposes on the condition that the lessee of the waterpower will pay the licensee of the berth the value of timber of ten inches and over, in diameter at the stump on the tract withdrawn, the value of the timber in case of dispute to be fixed by the Minister of Interior.

Final settlement of the cartage question makes it apparent that while shippers in Montreal and Toronto will hereafter have to pay 4 cents per hundred pounds those in Ottawa in common with London and other smaller cities, will be taxed only 3 cents per hundred pounds, which is what they have been paying since the first increase in October last.

Provision for the grazing of livestock on reserves containing grass land areas is made in new regulations governing Dominion forest reserves which have gone into force. They are modeled on those

of the United States and will make available to the Dominion forest service a source of revenue second only to that derived from the management of the timber on those reserves, it is expected. The minimum dues for cattle and horses will be five cents per head per month and the maximum 10 cents. Sheep will be grazed at one-quarter this charge.

A bulletin of the Conservation Commission issued last week states that a total of sixteen professionally trained foresters are now employed by the Quebec Forester Service and that there were fourteen parties in the field last summer valuing unlicensed Crown timber lands. It was estimated that there were approximately 125,000 square miles of such lands in Quebec Province while the Crown Lands under licenses aggregate 70,000 square miles, producing a revenue of about \$1,750,000.

Free lumber and lower freight rates on lumber and paper were among the requests made by a deputation representing the Western Grain Growers and the Dominion Grange which waited on Premier Borden and the members of his cabinet last week in regard to tariff changes which a large section of the agricultural population of the West desire. The deputation also asked that action be taken in regard to ocean freight rates. Although consideration only was promised by Premier Borden, it is known the requests as to rates are viewed favorably by the Government. As to the lowering of tariffs on lumber, however, which the Western people desire in order to allow the importation of lumber from the United States to the prairie provinces, there will be considerable difference of opinion and—if the issue is raised—considerable opposition.

Of considerable interest to the trade is a report on the water power potentialities of Manitoba which has been completed by the waterpower branch of the Interior Department. The report has been forwarded to Judge Robson of Winnipeg, utility commissioner of Manitoba, who is now engaged in preparing a report to the Provincial Government in connection with the question of development of water powers within that province with a view to the inauguration of a hydro-electric commission something similar to that of Ontario. It is stated in the report that power possibilities of the smaller rivers of the Province are limited and of local importance only. The main sources of dependable power in commercial quantities are the Winnipeg River, the Grand Rapids and the Saskatchewan River and the large rivers of the North including the Nelson, the Churchill and the Beavers. The Winnipeg River is found to be one of the most notable power rivers on this continent. Its flowage can be so regulated as to be practically uniform throughout the year and it has power possibilities of 400,000 horse power development.

Claims dating back twenty-five years ago and involving timber and pulpwood areas of considerable extent were considered at a conference recently, between the Minister of the Interior and Hon. W. H. Hearst, Minister of Lands, Forests and Mines for Ontario. The claims had their origin at the time when considerable territory was added to Ontario by the old boundary award and relative compensation to the province for certain lands taken for Indian reserves. It was announced at the conclusion of the conference that a basis of settlement had been reached.

ROSIN TROUBLES ON PAPER MACHINE.

The clogging of press rolls with rosin, rosin spots in the wire, etc., in chemical and ground wood papers and papers glazed on one side are among the most troublesome things I have encountered in many years' practice, states a writer in the "Wochenblatt," who says he has noted these disturbing conditions in different mills to an extremely varying extent. Whereas one plant will suffer badly from them, and another less, there are also mills where nothing whatever is known of them. He says he was in a mill that produced its own cellulose, with a small outfit. A great deal had to be produced so that the boiling was quick and sharp; and they were never free from rosin troubles. In another mill, where the chemical fibre was purchased, rosin gumming occurred only occasionally; in a third, where only good quality cellulose was used, rosin troubles never occurred. He attributes this to the use by the first mill of a cellulose that was not perfectly digested. The thick, coarse fibers retain the rosin which is softened and changed by the boiling process and acquires more the properties of pitch, and does not release it in the washing, whereas well boiled and disintegrated cellulose, during the washing, is entirely freed from rosin which, owing to the longer boiling process, is completely dissolved in the lye.

To the rosin in the cellulose, the rosin or pitch spots on the machine wire are mainly due. Most papermakers will know how injurious such a clogged wire will be to the quality and appearance of a paper and how tedious and troublesome is the process of cleaning the wire from the coarser spots at least. Of course, a badly disintegrated cellulose will not felt so closely as one that is thoroughly disintegrated, because its fibres are coarser and stiffer. This makes itself disagreeably evident in the production of newsprint paper on quick runs, in the sticking and tearing of the paper sheet. It is ultimately necessary to increase the proportion of chemical pulp, but finally, with a thirty per cent. charge, the results obtained are not as good as with twenty per cent of a sound, well digested pulp.

The ground wood, too, sometimes contains rosin. As, however, it has been subjected to no boiling process, the rosin is more finely distributed. It is not a pitchy rosin and consequently no rosin spots are formed in the wire; on the contrary, a dry and gritty mass may be noted on the doctor of the first press roll. If the woodpulp has been coarsely ground, it is better for it to remain so than to be ground down in the finishing machine for the "dead" or beaten particles produce patches on the machine, it also sticks to the press rolls and finally, working rapidly, it is not possible to produce a good close paper, but there will be thin patches on it. That which has been ground down on a sharp stone, is and will remain "free," no matter how fine it may be ground in the Jordan. For this reason, the main point in woodpulp production is centered in the grinding process.

If the sulphate pulp is perfectly digested and the ground wood is not too coarse and short, and if the sizing is properly prepared and is not added to the beater until after beating and before alum in sufficient quantities is added, there will be no rosin troubles on the paper machine, of course, other causes may produce spots in the wire for instance if lubricant from the bearings gets into the pulp, but then the raw material can not be regarded as responsible.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

London, Jan. 1st, 1914.

At the ordinary general meeting of the Amalgamated Press, Ltd., held in London, Mr. George A. Sutton, vice-president, made a reference to the subsidiary companies under their control. He said that what he might call the manufacturing side of their business was an extremely valuable asset and he might mention the Imperial Paper Mills, Ltd., the Anglo-Newfoundland Development Company, Ltd., and the Empire Printing Ink Company, Ltd., were doing well. During the year the Imperial Paper Mills, Ltd., and the Empire Printing Ink Company, Ltd., had added to the profits of the company, and, as he mentioned he hoped that the company will eventually receive large profits from these subsidiary companies. As was pointed out last year, the Imperial Paper Mills, at Gravesend, are quite the most up-to-date paper mills in the United Kingdom, in addition to being the second largest. At Gravesend, they had eight of the most modern machines in paper-making now in operation and a further two were in course of construction and will be running next year. The magnificent site upon which the mills were erected, covers an area of some 49 acres, the freehold of which belonged to the company. The Anglo-Newfoundland Development Company, Ltd., continues to make steady progress, as may be seen from the issue of the last balance-sheet, which showed a considerable increase in profits on the previous year's trading.

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M. F. W. Dobson, of the Kettlebrook paper mills, in Staffordshire, has patented improvements for bleaching esparto. The grass after being boiled is well washed to remove the soda and other lye used in boiling. When washed the esparto is brought to a dry, or semi-dry state, this being done in any suitable form of hydro-extractor, or by heat, or natural drying. To shorten the period of drying the bulk of the moisture may be removed by passing the esparto between squeezing rollers or under a press. In this connection the material may be formed into blocks, or sheets, suitable for handling. When washed or brought to a dry or semi-dry condition the esparto is ready for bleaching. The bleaching operator is carried out in a closed rotary drum, and with the aid of a concentrated bleaching liquor in the manner set forth in a former patent (No. 3181, 1911). With the esparto introduced into the drum in a semi-dry or dry state, it more readily absorbs the bleaching liquor, while owing to the rotation of the drum the operation of bleaching is affected more quickly and economically than heretofore. In regard to the strength of the bleaching solution and the quantity used, the same strength and the proportions as those named in the prior specification may be adopted. The drum may also be plain on its interior, or fitted with agitators to break up or turn over the esparto; or the drum may be lined or unlined.

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The British paper mills during 1913, have had on the whole a fairly successful year—it can not

be called a good year, because there were various factors to tell against large profits being made. From time to time the reports of companies and mill owners sent from London to the PULP AND PAPER MAGAZINE, have given an idea how things were going, but from experience it will be gathered that the coal strike of 1912 and the serious strikes that occurred spasmodically during that year and in the first half of 1913, have somewhat seriously militated against big profits being turned-over. However, there is hope for 1914, if the labor element can only be kept quiet. The British paper manufacturers also find it impossible to get any increased prices on their paper to meet the increased cost of production, which though not at times, has at other certain periods been more expensive. However, there is strong study on the part of paper mill engineers and mill owners to get as much as possible in the way of labor saving devices and machinery that will reduce the cost to a nicety. That is a point that is engaging great attention and during 1913, a large number of new machines have been installed and old and obsolete material brought up-to-date, or discarded as the case may be. Generally speaking the year was a good one for suppliers of paper-making machinery.

Messrs. Charles Morsden & Sons, Ltd., announce a gross profit for their year of £25,661 and a net profit of £11,406. With the balance brought forward there is £12,492. They propose to unite off for depreciation £3,117, and as extra depreciation £3,000. A dividend of $2\frac{1}{2}\%$ for the year is recommended on the ordinary shares, which has as subsidiaries the Anglo-Newfoundland Development, and the Imperial Paper Mills at Gravesend, have paid a dividend of 40% and bonus last year. The profits amounted to £372,329. A. Armstrong & Co., Ltd., paper merchants, have made a net profit (including interest on investments) of £5,031, which, with the balance from last account, £2,594 makes £7,625. The directors propose to put £500 to reserve, pay a dividend of $2\frac{1}{2}\%$, making 5% for the year, on the ordinary shares, and carry forward £2,596. The accounts of Albert E. Reed & Co. (Newfoundland), Ltd., for their year show that after charging debenture and other interest, and deducting the credit balance of £910 brought forward, a debit balance remains at profit and loss account, amounting to £13,337. Another interesting financial item to pulp men in Canada is the amount of money Mr. Harry Wood, who died sometime ago, has left. It amounts to £25,225 gross and £20,986 net. Of course, Mr. Wood was in the pulp trade and often visited Canada.

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The project to inaugurate a British Dominion's Exhibition in 1915, has been fully endorsed in London. It will be held in the ground and buildings of the Crystal Palace. Canadian paper and pulp men should be interested to hear of the promotion of such an important exposition.

Two New Bills for Quebec Legislature

The Bill introduced by John Hall Kelly, M.P.P., from Bonaventure, provides that if a party owning a pulp and paper mill wishes to lay pipes over or under private property in order to bring water from some other point to be used in the mill, he will have the right to do so. After the pipes are laid, the owner of the soil will have the right to use the land, provided it does not injure or interfere with the pipes. If the parties can not come to an agreement, then expropriation proceedings will be taken under the Quebec Railway Act. Pulp mills are often obliged to go several miles from the mill to find the source of water supply. One private owner could tie up the whole business unless the charter of the company gave special powers to expropriate. In the future, the general law will give this right.

The second amendment relates to water powers. Under the Act before this amendment was passed, any one wishing to expropriate in connection with a water power, could not take possession of the land until a decision of the arbitrators was rendered. This was the cause of considerable delay and costs. With the amendment, the party expropriating will be able to obtain immediate possession, by giving security to pay the amount of the award when it will be rendered and costs if any.

Union Bag Company

Special to Pulp and Paper Magazine.

New York, N.Y., Jan. 12th, 1914.

Certain factors in the local trade state that the new tariff bill has had little adverse effect upon the business of paper companies and that it has actually proved beneficial to earnings in some cases.

One concern which has benefitted from the lower duties on paper and pulp is the Union Bag & Paper Company, which is now not only able to bring in free the pulp from its Canadian pulp mills but saves some expenses on importations of certain grades of paper which it does not manufacture and which is used for making special types of bags.

Earnings of the Union Bag for the current fiscal year, which ends January 31st, promise to be somewhat in excess of those of last year. This is due to the improved demand for the bags this year and to the better prices which have obtained for some time past. In the fall and winter of 1912 paper bags prices declined to an unprofitable level and although advances were announced in the spring and early summer, they did not begin to show their effect upon earnings until about four or more of the company's turnover is constituted for some months in advance.

Since the middle of the year, however, prices have gone steadily up and are now about 15% higher than at the same time last year. A revival of buying activity was witnessed in the fall, with some decrease in November. Present indications however are that the spring business will be satisfactory.

Several important economies have been effected during the past year, among which was the removal of part of the office force to Hudson Falls, N.Y. Some of the company's departments have also amalgamated thus effecting a further saving.

In the fiscal year, 1912-13, Union Bag & Paper showed profits of \$554,251 compared with \$1,017,835 the year before. Dividends amounting to 3% on the \$11,000,000 preferred stock were paid and after all charges a deficit of \$287,000 was reported. The company's surplus on January 31st last was \$1,563,827. As no dividends have been paid this year a small addition to surplus for the period is likely.

Forest Fires Minimized

The forest fire loss on Dominion Forest Reserves in Western Canada was smaller during the last season than ever before. On several of the reserves in Manitoba and Saskatchewan, fire occasioned no damage whatever, and on the Dominion reserves in the Railway Belt, B.C., the only green timber injured by fire was four acres of young lodgepole pine. Even on the Rocky Mountains reserve in Alberta, with the immense area of 13,373,856 acres, most of which is remote from settlement, fire destroyed only 1,150 acres of young timber, whose present value was small, and mature timber to the value of \$150. The total area burnt on this reserve was but two one-hundredths of one per cent. of the above acreage, and it is likely, when the reports are complete from other reserves, which are smaller and usually better protected, that the aggregate area burnt over by fire will be no greater than one one-hundredth of one per cent. of the total reserved area. The significance of this figure is apparent by comparison with the corresponding figure for the National Forests in the United States, where the area burnt over by fire in 1913, although admittedly the smallest in recent years, was about 0.03% of the total area.

That the fire loss on Dominion reserves in the West has been so remarkably small is due in large measure to the fact that the Government rangers unceasingly sought, and obtained, the co-operation of all with whom they came in contact, whether settler, Indian, hunter, tourist or packer. The new fire-posters ask for this co-operation instead of demanding it as previously; a plea for it is printed on railway time-tables and on licenses; it is secured from homesteaders by providing them with fire-fighting tools and by connecting rural telephone lines with ranger stations on forest reserves, and even the Indian, many of whom were careless with fire, are now induced to assist in its prevention by being presented honorary metal badges by the Dominion Government. Carelessness is the chief cause of forest fire and by its elimination the greatest difficulty in forest fire protection is overcome.

Mr. Jules Wood has been appointed superintendent of the Toronto Paper Company, at Cornwall. The company has made some changes in their organization.

PULP AND PAPER NEWS

The new plant of Gummed Papers, Limited, at Brampton, Ont., will shortly be in operation. The new building is 75x60 feet, two storeys high, and erected of brick. It is located beside the C.P.R. tracks and the motive power will be steam and electricity. The equipment is right up-to-date and consists of two Keller gumming machines, each 60 feet long, a Langston ribbon slitter and rewinder and two Wetmore glue heaters. The capacity of the plant will be three tons per day of gummed paper tape for wrapping parcels, staying the corners of paper boxes, etc., and also gummed cloth for the same purpose. This is the first industry of its kind in the Dominion although the raw stock is made by several different mills. The President of the Company is Captain R. R. Barber, son of John R. Barber, Georgetown, and the vice-president and manager is E. R. Colbert, late superintendent of the coating plant of the Provincial Paper Mills at Georgetown, who has been in the coating and gumming business for fifteen years. J. H. Hood, for several years representing the National Binding Board Company of New York City, is Secretary-Treasurer and will also look after the sales end. The company have adopted the trade mark of a seal and the output will be known as "Seal Brand Products."

The annual sales convention of the Beaver Board Companies, who have a plant at Ottawa and are erecting another at Thorold, Ont., costing half a million dollars, in which the machinery is now being installed and will be in operation in April next, held their annual convention in Buffalo from January 5 to 10, which was attended by fully seventy salesmen, several being present from Canada. The remarkable growth of the Beaver Board companies during the past seven years was commented upon with much satisfaction, and the convention closed with a large All-Beaver banquet at the Sattler hotel. The President of the Company is W. F. MacLashan, of Buffalo, and the vice-president is H. S. Lewis, Beaver Falls, N.Y. The engineer in charge of the new plant at Thorold, is E. E. Whitney.

On his return from England, Hon. Adam Beck, box manufacturer, who is Chairman of the Ontario Hydro-Electric Commission will be tendered a demonstration in Toronto which will be followed by a banquet. Representatives of the power union and all the municipalities using Hydro power will be present. A meeting was held in Toronto this week to make preliminary arrangements and it is expected that the event will come off some time next month.

As forecasted in the last issue, W. P. Gundy, Managing Director of W. G. Gage Company, Toronto, and the Kinleith Paper Mills, St. Catharines, Ontario, who has been vice-president of the Board of Trade in Toronto, has been unanimously elected to the Presidency of that influential body. Mr. Gundy, who is also vice-president of the Canadian Pulp and Paper Association, is receiving the con-

gratulations of his many friends in the trade on his appointment.

The head offices of the Spanish River Pulp and Paper Mills, have been removed from the Royal Bank Building, 12 King Street, east, to the fourth floor of the Tyrell Building, 95 to 97 King Street, east, Toronto, where very convenient and nicely arranged quarters are now occupied.

G. A. Howell of the Howell Company, pulp and paper stock dealers, Toronto, appeared recently before the Railway Commission at its sitting in Toronto in reference to the difference in freight rates in imported sulphite pulp, to various points on the railways in Quebec Province. The company supplies pulp to Shawinigan Falls and also to Windsor Mills. Although Windsor Mills is considerably nearer Montreal than Shawinigan Falls, the freight rate to the former place was higher than to the latter by one cent per hundred pounds. It was pointed out that this had militated against the possibility of doing business with Windsor Mills. Mr. Howell has just received word from the Commission which, after fully investigating the matter, has issued an order to the railway companies to reduce the freight rate from Montreal to Windsor Mills from nine to eight cents per hundred pounds which is the same as applies to Shawinigan Falls.

Toronto rag and paper stock dealers have received word that the import commodity rates on rags and waste paper stock to United States points via St. John, Halifax and Portland, have been discontinued by the C. P. R. and G. T. R. and that class rates will become effective in February 1st, which means an addition of three to four cents per hundred.

The publishers of Toronto have organized a publishers' Hockey League in which the Toronto World, the Southam Press, the Methodist Book and Publishing House, the Toronto Star, the MacLean Publishing Company and W. J. Gage Company have entered teams.

F. Sidney Evans, for several years manager of the publication department of the Methodist Book and Publishing House in Toronto, died very suddenly a few days ago as a result of a paralytic stroke. He had been employed in this firm twenty-six years and was forty-one years old.

The Lakes Timber Company, Limited, with a share capital of \$500,000 and head office in Fort Frances, have been granted a charter to cut timber and manufacture and deal in all kinds of timber, wood and timber products and to carry on the business of lumbermen. The company will operate in the Rainy River district. The incorporators of the company are William J. Law, A. D. Rahn, of Minneapolis, Minn., Otto H. Diercks of Rainy River, A. B. Colburn of International Falls, Minn., and William F. Zauke of Spooner, Minn.

Hydro bylaws were voted upon in the recent Ontario municipal elections in several towns. Hanover, Strathroy, Wallaceburg, Elora and Kemptonville carried the bylaw by large majorities while

the measure was defeated in Sandwich. The adverse majority in Sandwich is only the third of its kind in the history of the Ontario Hydro-Electric Commission, and, when the municipalities in which the people have voted the authority, have been linked up, the Commission will represent more than one hundred places in Ontario.

The Canada Paper Company, whose mills are located at Windsor Mills, Quebec, some time ago adopted the course recommended by several authorities in the PULP AND PAPER MAGAZINE of closing down the plant at noon on Saturdays. This avoided all Sunday work in the shape of overhauling, repairs, cleaning etc., which is done in the majority of paper mills on Sunday. All the employees of the company were given longer rest including those who had to labor on the latter day. The plan of shutting down the machines at noon on Saturday, worked first rate and every one was pleased, with the new system. The company have got so busy, however, that it has been found necessary to run all day Saturday until the present rush is over.

Following the usual custom, inaugurated by them several years ago, the W. J. Gage Company, Toronto, have given all their employees a bonus on the business of the past year, based on their length of service, individual earnings, etc. Speaking of profit sharing, Mr. Gage, in a recent interview, said that the company did not do it for effect, but because they believed that it was the right thing to do and the plan had proved mutually beneficial.

A charter has been granted to the French River Lumber Company with head office in Toronto and a share capital of \$40,000 to conduct a lumbering and timber business in all its branches. The incorporators are Henry E. Hurlburt of VanDorf, Ont., and others.

Brown Bros., the oldest stationery firm in Canada, in the manufacturing line, having been in business for sixty seven years, have just removed from 51-53 Wellington Street West, into their larger and more commodious quarters, in the building formerly occupied by Rolph and Clark, Limited, at the corner of Pearl and Simcoe Streets, Toronto, which they bought some months ago. Brown Bros. in their new home will add considerably to their facilities.

The Grolier Society of London, a corporation created under the laws of New York State, have obtained a supplementary license to do business in Ontario and have just opened up offices at 307 Manning Chambers, Toronto. The company are empowered to carry on the business of booksellers, publishers, lithographers, engraving, bookbinders, advertising agents, etc., and also to carry on the business of manufacturing, producing, purchasing, selling and dealing in all kinds of paper and all materials that may be used in such manufacture. Eric Depler, of Toronto, has been appointed Canadian representative of the Grolier Society.

In the list of New Year honors bestowed by King George, among those decorated were Sir Douglas Colin Cameron, Lieutenant Governor of Manitoba, and Sir Henry Kelly Egan, of Ottawa, each of whom are leading and wealthy lumbermen. Aubrey White of Toronto, Deputy Minister of Lands and Forests, was made a C. M. G. Commander of St. Michael and St. George. Mr. White has been in the service of the Ontario Government for thirty-eight years. He was chief clerk of the Forestry branch for seven years, and

has held his present office since 1887. In his official capacity he has in connection with Crown lands concessions and timber licenses, has much to do with pulp and paper companies and is deservedly popular for his honorable business relations and excellent administrative ability in these matters.

The premises of E. Pullan, rag and paper stock dealer, 490 Adelaide Street West, Toronto, was visited by fire last week, but the blaze was extinguished after damage to the extent of a few hundred dollars had been done.

William A. Anderson, the new superintendent of the Kinleith Paper Mills, at St. Catharines, who succeeds A. A. Briggs, who resigned owing to ill health and will reside at St. Catharines, has entered upon his new duties. Mr. Anderson, who was in charge of the Milham Division of the Bryant Paper Co., Kalamazoo, Mich., was, previous to his departure for St. Catharines, presented with a gold watch and chain and a beautiful Masonic charm by the four hundred employees of the mill, among whom he was deservedly esteemed. He has had wide experience as a papermaker and brings to bear on his new duties a thorough insight and practical acquaintance with every branch of the business.

Forbes Wood, late superintendent of the James Ramage Paper Co., of Monroe Bridge, Mass., has been appointed superintendent of the plant of the Toronto Paper Manufacturing Co., at Cornwall, and has entered upon his new duties, succeeding M. Carroll, who has resigned. Some years ago Mr. Wood was superintendent of the Cornwall mill and now returns to his former position after holding several important positions across the border.

The capital stock of Barber-Ellis, Limited, who have works in Brantford, Ontario, and warehouses in Toronto, Winnipeg and Vancouver and are the largest envelope manufacturers in the Dominion, has recently been increased from \$125,000 to \$500,000.

The six storey brick addition to the premises of Warwick Bros. and Rutter, manufacturing stationers and printers, 401 King St., West, Toronto has been completed and will add considerably to the facilities of the firm.

The Montreal Trust Co., liquidators of the East Canada Power and Pulp Co., are calling for tenders for the pulp wood of the latter company in the yard at Murray Bay, in the Murray River and its tributaries. Bids will be received up to February 2nd, and the successful tenderer may have the use of the mill and mill property of the company for the purpose of manufacturing the pulp wood into pulp until September 1st, if desired.

It is announced that the Grand Falls Company, Limited, will begin work very soon and erect large pulp and paper mills at Grand Falls on the St. John River, where immense power can be developed, and where it is proposed by this company to build up a very extensive industry. It will be possible to develop electric power at Grand Falls and transmit it long distances to towns and villages along the river. Sir William Van Horne is associated with this enterprise. Various companies have secured rights and powers at different times with a view to development such as is now proposed, but for one reason or another nothing practical was accomplished. The present company has ample capital,

and during the last year engineers have been at work upon its plans. Mr. Hardy S. Ferguson of New York, is the engineer. The International Paper Company is also interested.

Riordon Pulp and Paper Company renewed an option taken last summer on a large acreage at the southern limits of Haileybury, Ont. The option expired at the end of 1913. The company could not arrange for construction of the pulp mill proposed within the time of the option and a twelve months' renewal has been effected. Surveys will be started in the spring, with the possibilities of construction work starting in the summer.

An order in council has been passed amending the regulations governing the granting of licenses and permits to cut timber on Dominion lands in the prairie provinces, the northwest territories and certain parts of British Columbia. The amendment provides for the withdrawal from timber berths held under the license of land required for water power purposes. The condition for such withdrawal is that the lease of the water power will pay the license of the berth, the value of all timber of ten inches and over in diameter at the stump. The minister of the interior will fix the value of the timber in case of dispute. The new regulation is said to be in accordance with the government's new water power policy.

Plans are being arranged for the erection at Oakville, Ont., of Blotting Paper Mill. When this is completed, it will be the first in Canada.

Following the lead of the International Paper Company in the East, western manufacturers in the United States, of newsprint paper have decided to reduce materially their production in the mills of Wisconsin, Michigan, and Minnesota during 1914. Most of the manufacturers of newsprint paper, it is said will change to some other grades as far as business will permit. The International Company will curtail its production of newsprint by 100,000 tons next year. This reduction, in addition to that made in 1913 will decrease the output of that company about 25 per cent. Canadian competition is the chief reason stated by manufacturers in this country for restricting their newsprint production.

Because, as the bank claimed, he "interfered" with a quantity of logs and property of the defunct Imperial Pulp and Paper Mills, of Sturgeon Falls, the Quebec Bank, which was a leading creditor, sued E. R. C. Clarkson, official receiver of the mills, for damages. It seems that Mr. Clarkson, in the course of his winding-up proceedings, found part of the boom of logs, which the bank claimed to own, in imminent danger of going over the dam, and had them removed. For this service the bank thanked him with a damage suit. Judgment was given today at Toronto, the Master-In-Ordinary deciding that the bank, far from suffering from Mr. Clarkson's action, was in reality very much obliged to him for sparing them very considerable expense by his action in having the wood removed. The bank therefore loses its case.

Anchore ice has been seriously hampering some of the Canadian paper mills. One of the incidentals of such an unwelcome visitation has been to test a brand-new and very ingenious scheme put into effect by Manager Millen, of the E. B. Eddy Company, at Hull, Quebec. When the company decided to more than double their old water powers by putting in new wheels and new systems and converting the whole into a hydro-electric plant, Mr. Millen planned a way out of the annual ice troubles

He had the entire forebay covered with a concrete platform, and put two fans under this platform, and one fan inside, near the clear-story roof. These fans exhaust all the steam and hot air of the mill and inject into the vacant space over the water and under the flooring of the forebay. This keeps the temperature of the racks just sufficiently warm to prevent the ice from forming on them.

The Montreal Trust Company, of Montreal, the liquidator for the East Canada Pulp and Paper Company, Ltd., whose mill is at Murray Bay, Que., is calling for tenders for the purchase of the company's pulp wood in the yard at Murray Bay and in the Murray River and its tributaries. The tenders have to be in by February 2nd next. The successful tenderer will be given the use of the mill and mill property of the company at Murray Bay for the purpose of manufacturing the pulp wood into pulp until September 1st of this year.

The Canadian Northern Railway, which calls itself the paper mill road of Canada, inaugurated today a fast freight service between Montreal and Toronto on the new main line just completed. This will mean that many points—including such places as Strathcona, on the Bay of Quinte Railway—which formerly took branch line rates, are now given main line rates and freight service. The Canadian Northern Railway is now connected up with all the paper mill towns in Southern Ontario, as well as in the Province of Quebec. A day or two ago Sir William Mackenzie, the president of the company, drove the last spike connecting the eastern and western lines of the company. The ceremony took place north of Lake Superior, midway between Sudbury and Port Arthur. The company now has only to finish its line through the Rocky Mountains in order to have a continuous main line from the Atlantic to the Pacific. This will be done about midsummer.

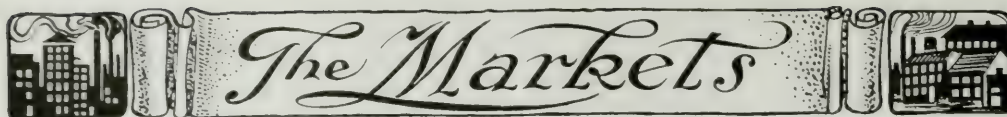
The Canada Securities Corporation are offering \$200,000 six per cent. first mortgage bonds of the Sheldons Limited of Galt, Ontario. The bonds are in denominations of \$100, \$500 and \$1,000. The company's capitalization is \$200,000 bonds issued; \$600,000 ordinary stock authorized and \$300,000 issued. The board of directors is comprised as follows: W. D. Sheldon, president; S. R. Sheldon, vice-president; Jas. M. Smith, John A. Stephenson, A. K. Spotton, all of Galt, Ont.; F. H. Manley, of Montreal, and J. H. Paine, Toronto.

ACCIDENT AT DONNACONA.

A disastrous accident which will have serious results occurred at the Donnacona Paper Company works situated at the mouth of the Jacques Catier River in the parish of Les Ecureuils, when 200 feet of a steel pipe 12 feet in diameter fell in. The accident is thus explained:

A vacuum was made in the pipe, but it is supposed that some air remained and when the water entered the pipe an explosion took place, bursting the pipe under the high pressure. This pipe was to carry the water to the workshops. Work was to be commenced for the manufacture of paper in these workshops, but this accident will delay the works for a month or six weeks, which will be a great loss for the company and for the workmen.

It is stated that the damage by this accident will amount to about \$10,000.



Canadian Markets

Now that the holiday period is over and most of the paper houses and mills have completed inventories, the trade is looking forward to a good business year during 1914. New mills continue busy and prices remain firm. Those concerns looking for renewal contracts have held out for the same figure as last year and the majority of the larger operators have their output pretty well contracted for during the coming twelve months. In the book and writing paper line as well as in bonds, ledgers, etc., business is only fair and has not picked up as yet. However, the outlook is hopeful. The printing trade has not been as active as it was some months ago which caused a falling off in small quantity orders. Makers of wrappings of all kinds are keen for business and prices to jobbers are easier than they were several months ago. Ground wood pulp demand has fallen off and, while there are a number of inquiries, prices are not as firm as formerly, either at the mill or delivered. The sulphite situation is somewhat firmer owing to the close of navigation and the winter freight rates, particularly on foreign importations. In the rag and paper stock market there is not much doing and prices have taken a tumble in mixed papers and other lines such as mixed shavings, white blanks, roofing stock, etc. In fact, there has been a slight drop all around and mills are not disposed to buy freely at present. Mixed papers shipped from Toronto have been delivered in considerable quantity in New York and the western states and have brought less than ten dollars per ton. The paper houses which will soon hold their annual meetings will show, in some instances, as good a business as last year and in other cases a falling off. Some mills will show an advance but it is hardly expected that many will make the showing either in net profits or volume of 1912, which was a record year with most of them. That the future is looked forward to confidently, is attested by the fact that during the past week, new companies in various lines were organized in Ontario with an aggregate authorized capital of six million dollars. This is the best record made in many months.

Quotations f.o.b., Toronto, are as follows:

Paper

News rolls \$42 to \$45 delivered.
News sheet \$15 to \$50, delivered.
Book papers, carload, No. 3, 4.75c to 1.50c.
Book paper (top lots) No. 3, 4c to 4.50c.
Book paper (carload) No. 2, 4.25c.
Book paper (top lots) No. 2, 4.50c to 5c.
Book papers, carload, No. 1, 4.75c to 5.25c.
Book papers (top lots) No. 1, 5.25c to 7.75c.
Wrappings 5c to 7c.
Sulphite Bond 6c to 8c.
Tissue \$3.00 to \$3.75.
Manila B. \$2.50 to \$4.25.

Manila No. 2, \$2.75 to \$3.50.
Manila No. 1, \$3.00 to \$3.75.
Un glazed Kraft, \$3.90 to \$4.50.
Glazed Kraft, \$4.50 to \$5.00.

Pulp

Ground wood (at mill), \$15 to \$16.
Ground wood, \$22 to \$24, delivered in United States.
Sulphite (unbleached), \$43 to \$45, delivered in Canada.
Sulphite (unbleached), \$43 to \$46, delivered in United States.
Sulphite (bleached), \$58 to \$60, delivered in Canada.
Sulphite (bleached), \$58 to \$62, delivered in United States.

Paper Stock

No. 1 hard shavings, \$1.87½ to \$1.90.
No. 1 soft white shavings, \$1.70 to \$1.75.
No. 1 mixed shavings, 50c.
White blanks, 82½c. to 85c.
Ordinary ledger stock, \$1.20.
Heavy ledger stock, \$1.40 to \$1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c. to 50c.
No. 1 manila envelope cuttings, \$1.10 to \$1.15.
No. 1 print manila, 65.
Folded news, 50c.
Over issues, 52½c.
No. 1 clean mixed paper, 30c. to 32½c.
Old white cotton, \$2.50 to \$2.75.
Thirds and blues, \$1.30 to \$1.32½.
No. 1 white shirt cuttings, \$5.00 to \$5.25.
Blue overall cuttings, \$3.50 to \$3.62½.
Black overall cuttings, \$1.75.
Black linings, \$1.75.
New light flannelettes, \$4.50.
Ordinary satinet, 75c.
Flock, 90c.
Tailor rags, 65c.

Quotations f.o.b. Montreal are:

Book and News Paper.

Roll News, \$41 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
Ream News, \$45 to \$47 per ton for large orders; \$50 to \$75 per ton for small orders.
No. 1 Book, 5½c. to 6c. per lb.
No. 2 Book, S.C., \$4.60 to \$4.75 in large quantities; \$1.75 to \$5.50 in small quantities.
No. 3 Book M.F., \$4.10 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
Mostly all paper houses allow a discount of 2% to 3% for payment in 30 days.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.35; 5 tons, \$2.45; 2 tons, \$2.55; 1 ton, \$2.56; less, \$2.75.
Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
B. Manila, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
No. 2 Manila, car lots, \$3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
No. 1 Manila, car lots, \$3.45; 5 tons, \$3.45; 2 tons,

\$3.55; 1 ton, \$3.65; less, \$3.75.
 Fibre, car lots, \$3.35; 5 tons, \$3.45; 2 tons, \$3.55;
 1 ton, \$3.65; less, \$3.75.
 Kraft, $3\frac{1}{2}$ ¢. to $4\frac{1}{2}$ ¢.

Most of the manufacturers are quoting 10% less than the above prices to the jobbing trade on the cheaper lines of wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground woods, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

THE BRITISH MARKETS.

(Special to the Pulp and Paper Magazine.)

London, January 1st, 1914.

Owing to Xmas holidays and the dislocation of business generally the chemical and mechanical pulp markets are lifeless. There appears to be nothing doing at the moment of writing. A good deal of talk is current over the disappointment the Scandinavians have received through the American tariff. They were hoping that before the end of the year there would be a keen rush for pulps and consequently prices for British consumers were kept on a high level. It is suggested by pulp men that the Canadian mills will give the States in 1914 a larger supply than was the case in 1913 and this will prove another serious factor against the Scandinavians. In England, Canadian pulp is always appreciated, but there is the German and Scandinavian competition to be contended with. Scandinavian makers of pulps now maintain that though they have secured a fair amount of forward business in December, in the States, the fact must not be lost sight of that Canadian competition will in the near future have to be contended with. They admit that the tariff has caused disappointment and concessions are now being made to British buyers who are in the market for pulps. But stocks are heavy and little is doing until the New Year is more advanced.

* * * *

The paper industry generally is quiet in England, at the moment owing to the holidays. Some of the mill men are on the Continent or in Switzerland having a short respite.

* * * *

Trade in fillings and loadings for paper manufacturers is quiet, but prices are firm. There is plenty of China Clay in stock, but Mineral White is very scarce just now.

* * * *

Esparto has reached a high level. Full prices are asked for and paid for prompt supplies, but forward shipments are checked owing to the high rates that prevail.

NEW YORK MARKETS.

(Special to the Pulp and Paper Magazine.)

New York, N.Y., Jan. 13th, 1914.

Makers of ground wood pulp during the past ten days have been forced to greatly reduce their operations. In consequence production at present is about 65% of capacity. This situation has

naturally caused a slightly better feeling in the current inquiry, but producers who make pulp for sale only say they would rather hold their stocks and take a chance on the future than sell same at prices lower than those quoted at present. The general feeling prevails, that extreme cold weather will visit the manufacturing section soon, and if so, ground wood production would be greatly increased, and additional supplies eagerly sought after. Grinders are therefore accumulating stock, in anticipation of a stiff market before the early spring.

Movement in chemical pulps is inclined to be very quiet at present. Consumers continue to hold off in their contract making and are only buying as actually needed. Importers, as well as domestic producers, however, are very optimistic as regards the future, and each and everyone express views that 1914 will witness a decided change for the better, both as regards prices and general demand. Many of the foreign mills say they have already contracted for their 1914 output, and if such is the case, they can afford to be very firm in their price views.

Waste papers and rags are still rather inactive. Mills either have a fair supply of stock on hand or are not running up to capacity. In most cases the former solution holds as local distributors say that answers to many of their offering, is to the effect that "we are well filled up." It is, however, the belief that mills are using this expression to force prices down. That they have succeeded in this to a certain extent is quite evident as prices are inclined to be very weak in all lines and distributors are only too anxious to dispose of supplies at very low figures.

Pulp.

Ground Wood, No. 1, \$17 to \$19 per ton, f.o.b. mill.
 Ground Wood, No. 2, \$15 to \$16 per ton, f.o.b. mill.
 Unbleached sulphite, domestic, 20.05¢. to 2.20¢. per lb., delivered.
 Unbleached sulphite, imported, $1\frac{1}{2}$ ¢. to 2¢. ex dock, New York.
 Bleached sulphite, domestic, 2.90¢. to 3¢. per lb., delivered.
 Bleached sulphite, imported, 2.70. to 2.95¢. per lb., ex dock, New York.
 Easy bleaching sulphite, imported, 2.10¢. to 2.20¢. per lb., ex dock, New York.
 Unbleached sulphite, imported, 1.80¢. to 2.10¢. per lb., ex dock, New York.
 Bleached sulphite, imported, 2.60¢. to 2.80¢. per lb., ex dock, New York.
 Kraft pulp, imported, 1.85¢. to 1.95¢. per lb., ex dock, New York.
 Soda pulp, domestic, 2.15¢. to 2 $\frac{1}{2}$ ¢. per lb., delivered.
 All quotations of foreign products are made on a basis of ex duty.)

Paper.

A more cheerful aspect is to be found among the local paper trade, as regards the volume of business done since the opening of the new year—the larger consumers having shown a little more confidence in business conditions by placing many of their belated orders. The end of the year lagged a little slower than ordinarily, but the advent of 1914 seems to have witnessed a complete change. Now that the annual stock takings have been practically completed, and road salesmen have left head-quarters, there seems to be a much better undertone to the market. In fact not a few orders

of good size have been placed during the past week, and nearly all lines are manifesting a much more steady undertone. It is too early yet, however, to make any predictions for this year, but it seems to be the consensus of opinion of all concerned that 1914 will witness a much more steady. One manufacturer today stated to your correspondent: "While the orders are still small, there is a marked improvement on the volume of my own business over that of a year ago as to make me forget the trials of the past, and as I find little complaint from other members of the trade, I assume that business must also be greatly improved in all other lines of paper. If it were not, you would find the anvil chorus swinging in full harmony. There is no doubt but that the new tariff is affecting nearly all lines, as the large buyers continue to hesitate in placing their orders very far ahead. A careful study of the industrial situation, shows that newsprint is much more steady in price, due to the fact that the disturbing factors have apparently filled their output for 1914 and withdrawn from the market. Manufacturers of book paper report a much more steady inquiry and though several orders have been placed at extremely low figures, the general situation is quite firm. Tissue papers are moving in a fair to active volume with prices ruling reasonably firm. Writings and other similar lines are still somewhat quiet, but the feeling is strong. Manilas are hard at current levels. Fibres are without change and reflect about the same situation. Makers of Bogus claim heavy orders in hand, and in consequence prices are being strictly adhered to. Krafts rule firm under a steady inquiry; boards are inclined upwards, most mills report plenty of orders on hand for sometime to come. Screenings continue to move in a good volume for this period. Quotations throughout the list have not changed since last reported, and are accordingly repeated as follows:

News, rolls, transient business \$1.95 to \$2.00 f.o.b. mill.
 News, sheet, \$2.10 to \$2.15 f.o.b. mill.
 Book papers, car lots, C. & S.S., \$4 to \$4.20 f.o.b. mill.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b. mill.
 Writing paper, superfine, 11c. to 13c. del. east of Miss. River.
 Writing paper, extra fine, 10½c. del. east of Miss. River.
 Writing paper, No. 1, fine, 9c. del. east of Miss. River.
 Writing paper, No. 2, fine, 8c. del. east of Miss. River.
 Writing paper, engine sized, 4½c. to 8c. del. east of Miss. River.

UNITED STATES IMPORTS.

(Special to the Pulp and Paper Magazine.)

Washington, D.C., Jan. 13th, 1914.

Imports of Wood Pulp into the United States during the month of November, 1913, as reported by the Bureau of Foreign and Domestic Commerce, aggregated 31,324,656 lbs., mechanical, valued at \$255,644; 48,606,198 lbs., chemical unbleached, valued at \$809,817; and 5,709,671 lbs., chemical bleached, valued at \$135,195.

Of this amount, Canada furnished 31,246,156 lbs., valued at \$254,899 of mechanical pulp wood—there being but one other country (Norway, 78,500 lbs., valued at \$742) shipping ground wood into this country.

Sweden was the heaviest exporter of unbleached pulp, having shipped into this country during November, 24,412,563 lbs., valued at \$400,885. Canada, however, ranked second, with 11,129,120 lbs., valued at \$196,810. The other countries shipping into the United States during this period were: Norway, 6,820,010 lbs.; Germany, 5,153,494 lbs.; Denmark 448,000 lbs.

Imports of chemical bleached pulp were heaviest during November from Norway—there being 2,016,000 lbs., valued at \$46,652, brought into this country. Sweden exported 1,185,862 lbs., valued at \$22,770, into this country. Germany was third with 990,228 lbs., valued at \$23,903 and Canada fourth with 938,523 lbs., valued at \$24,856. The remaining importation of this item came from Austria-Hungary, namely, 579,058 lbs., valued at \$17,014.

Newsprint importations into this country during November, amounted to 48,286,712 lbs., valued at \$949,982. Of this amount, Canada's share was 47,604,637 lbs., valued at \$918,667. The balance follows:

	Lbs.	Value.
Austria Hungary	103,644	\$ 347
Belgium	36,90	1,217
Germany	313,995	11,251
Italy	3,908	732
Netherlands	112,838	6,038
Norway	49,877	1,266
Sweden	42,660	1,443
England	90,107	7,888
Scotland	21,412	1,133
Canada	47,604,637	918,667
Total	48,286,712	\$949,982

INTERNATIONAL REDUCES OUTPUT.

(Special to Pulp and Paper Magazine.)

New York, N.Y., Jan. 12th, 1914.

It is understood that the International Paper Company will make a considerable reduction in its newsprint production this year. While largely voluntary, this move is also dictated by overproduction, Canadian competition and low prices. Though officials of the company refuse to confirm the report, it is stated by competent authorities that the curtailment in 1914 will amount to between 90,000 and 100,000 tons, or a cut-down of over 15%.

The prices of newsprint has weakened materially during the last three months and at one time was below two cents per pound. At present it is about two cents which is, however, \$4 to \$5 per ton less than the price contained in the expiring contracts which International and other producers hold for 1913 sales.

The broad point, is that Canadian competition is throwing into this market at the rate of 150,000 tons more of newsprint than a year ago. The outlook for 1914 among the newsprint producers is not an auspicious one. If International Paper manages to earn and pay its present 2% dividend on the \$22,406,000 preferred, it will be doing all that can be expected.

Pulp and Paper Magazine

OF CANADA

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VOL. XII.

MONTREAL, FEBRUARY 1, 1914

No. 3

"Safety First."

The "safety first" movement has attracted much attention all over the continent and perhaps no movement has been more worthy of earnest consideration from employers and employees alike than this. The result is that in practically every line of industry we now see a tendency towards showing more consideration to human life and human welfare, more consideration for the lives and conveniences of the workmen and on all sides steps are being taken to minimize the danger of accident by various means. Workmen's compensation laws are recognized as necessary legislation in all industrial countries and laws compelling employers to provide safeguards over all danger points in machinery and elsewhere are now recognised as being a necessary part of our industrial activity.

In the paper industry, the field for such a movement as the safety first movement is great, perhaps larger than most employers and employees realize. In the first place, with the complicated machinery necessary the shaftings, belts, etc., and the "green" help that manufacturers are now compelled to employ on account of the scarcity of suitable labor the danger from accident is made apparent. Although the machinery that is now being placed on the market has most of these danger points guarded, this is not found to be the case on the older makes of machinery and employers do well to see that this condition is rectified. The lives of workmen are too valuable to be risked unnecessarily and manufacturers will be serving their own interests by providing safety devices in all such cases.

The safety first scheme can be worked to advantage in every department of the mill and every operative can be instrumental in its advancement and in the minimizing of danger, either to body or health. No matter what room one enters in a mill one can see workmen taking unnecessary risks, cleaning machines when they are running, or oiling intricate parts when they are in motion, or some such unnecessary operation. These are all risks that endanger the lives of the operative and establish a precedent, in that new help will probably follow the example, and when the accident occurs, as it most surely does sooner or later, the employer is compelled to pay a compensation. It is surely up to the workmen to exert every effort to minimize danger and also to every old hand to set a good example in this regard.

Linked with this feature of safety first is the interest the employer should show in the welfare of his workmen, both in and out of the shop. Safety first means safeguards to health and happiness as well as safeguards from bodily injury, and the employer who is interested in this manner is serving his own interests as well as the interests of his workmen. The efficiency and reliability of his workmen is a principal consideration, one that should occupy the attention of every manufacturer. The contented workman is the one who will be most efficient and reliable and contentment is only gained by making working and living conditions as safe and as pleasant as possible.

The series of pictures in this issue show many interesting guards throughout the mill.

The "safety first" movement embraces every branch of industry, and has, as its object, the reduction of the number of accidents among industrial workers. It may be said to consist of two parts. The first deals with the use of all kinds of safety appliances and the second, with the prevention of accidents by the education and co-operation of the employees. In Canada, the Provincial Factory Inspection Acts and Mine Regulation Acts, to a certain extent, deal with the former, but, as yet, little has been done by corporate enterprise with regard to the latter.

The movement originated with the United States Steel Corporation, and, up to the present time, it owes its effectiveness and achievements almost entirely to corporate enterprise. The co-operation of the men has also been obtained to a marked extent, chiefly by the formation of "Safety First" committees on which the men are represented and which make suggestions concerning the work. Rewards are given when suggestions are adopted and, in the case of the Steel Corporation, the majority of the most useful hints have come from the employees. The "safety first" policy has also been adopted by many of the Canadian and American railways and has been the means of effecting a marked diminution in the number of accidents. During eighteen months of its operation on the Chicago and Northwestern railway there has been a reduction of 51½ per cent of the injuries. In the case of the Steel Corporation a reduction of 43 per cent in the annual loss from accidents has been effected. Financially this represents a saving of over \$2,000,000 to the country, and, at the same time, a gain in working time to the company.

In Germany and in the United States, National Safety Bureaus and Museums have been established for giving information concerning safety appliances and for exhibiting the same.

It is pleasing to note that in July the Canadian Copper Company appointed a safety engineer in connection with a "safety first" policy for their mining and metallurgical plants. Although well trained rescue corps have been established in coal mines in Canada for the prevention of certain classes of mine accidents, this is the first step in the "safety first" movement among metal mines in Canada.

Mill Waste in Streams.

Large volumes of misguided discussions are appearing at the present time in Journals and Magazines throughout the country objecting to the pollution of streams by pulp mills. The editors of these journals seem to be going on the theory that any liquid going into the stream must necessarily be detrimental. As a matter of fact, there are hardly any instances in Canada where mills are

seriously affecting streams or rivers into which the discharge goes. A great many rivers into which such mills are dumping their waste have far more serious contamination from other sources and, for mills of the size we have in Canada, there are very few streams which would be affected by this disposal. In a very small stream if the waste liquor is not treated at all, it does effect the fish in the stream, but practically all our pulp mills are in such positions that this waste is so diluted that it has no effect. There has never yet been found in this country an instance where a stream really suffered from the pollution of a pulp mill. Of course, we all look with eager anticipation to the time when someone will discover better methods of utilizing the waste from sulphite mills, but up to the present time this happy hope has not been realized. Although many scientists of world-wide repute have spent their lives working on this problem, no solution has been obtained. It is true that in some foreign countries alcohol is being made from the waste liquor, but this is of no assistance in the pollution of the streams as the liquor after the manufacture of alcohol is just as detrimental as before. Unless there are cases where the liquor is affecting streams such as might be the case of a large mill on a small stream, the problem of pollution is nothing more than an attempt to cater to public opinion and secure attention for the paper making the howl. The paper trade in this country is polluting the streams far less than any other large industry.

In this connection there is now before the House of Commons a bill respecting the pollution of Navigable Waters, which reads as follows:

1.—No person shall put or deposit, or cause or permit to be put or deposited, or to flow or be carried, any sewage, offal or refuse, or any matter that is poisonous, noxious, decomposing, refuse or waste, into any navigable water or into any such water that flows into any navigable water, unless such matter is disposed of in accordance with regulations made under the authority of this Act.

2.—Every municipal corporation convicted of an offence against this section shall, upon summary conviction, be liable to a fine of not less than five hundred dollars and an additional sum of fifty dollars for each day during which the offence continues.

3.—Every corporation, other than a municipal corporation, convicted of an offence against this section shall, upon summary conviction, be liable to a fine of not less than two hundred dollars and an additional sum of twenty dollars for every day during which the offence continues.

4. Every person, other than a corporation, who is convicted of an offence against this section shall, upon summary conviction, be liable to a fine of not less than fifty dollars

and an additional sum of ten dollars for each day during which the offence continues, or to imprisonment not exceeding two months, or to both fine and imprisonment.

2.—The Governor in Council may make such regulations as are necessary to carry out the purpose of this Act, and such regulations shall be carried out and enforced by the Director General of Public Health, and shall have force and effect as and from the date of their publication in 'The Canada Gazette.'

3.—Where, at the date of the passing of this Act, any sewage or matter referred to in subsection 1 of section 1 of this Act flows into any navigable water, or into any other water which flows into any navigable water, this Act shall, in the case of municipal corporations, come into force two years after it is assented to by the Governor General, and in the case of other corporations and of persons shall come into force six months after such assent.

It is to be hoped that regulations made under the Act will be such as to allow of reasonable application in which case the paper industry will be the first to co-operate.

American Labor Organisers Have Eye on Canadian Paper Mills.

Ever since the passage of the new American tariff, there have been continuous rumours of interference from the American labor leaders in our Canadian industrial life, especially in the paper trade. We have reported from time to time in our new columns the instances of the visits of some of the leaders to this country, but we are now able to say on good information that an organized effort is being arranged in the United States to come to this country and organize all the paper mill workers. The recent labor troubles in British Columbia, which were investigated and supported entirely by labor interests to the south, shows us what an undesirable condition this would be. Aside from the question of the merits of organizing Canadian pulp and paper works, there is no doubt that it is a serious thing to have organizers whose interests are not in this country come over here and dictate to our workers. These men believe that a great deal more paper will be manufactured in Canada in the future and shipped to the States and it is their purpose to put the usual tax on this paper and force it to support the international labor organizations which have meant an enormous drain upon the workers. The conditions in the pulp and paper mills in this country are far better than similar conditions in the United States where all the paper mills have organized

labor. We do not need at the present time such an organization to better the conditions of our men in the mills. We have equally good conditions with equally good wages without the troublesome Union. Our workers are able to earn the same wages without having to pay a large tax every year to support labor officials in luxury and in many cases in indolence. It is not because the unions of the United States feel that the conditions under which Canadian workmen are working are not as they should be, but it is simply from a desire to have their finger in the pie and dictate to Canada, that they are taking this step and coming to this country. We think that Canadians in every walk of life should resent extremely this interference from outside sources. If the men in the paper mills want to organize, that is a matter which they should themselves be thoroughly competent to decide on and to execute, in case it was thought desirable, but to have an official representing labor of a foreign country come here to raise trouble among our workers is a serious situation. We hope that all workmen and mill officials will resist to the uttermost such outside interference.

Editorial Comment.

In Sweden attempts are being made to produce ethyl alcohol from sulphite liquors and the results are said to be quite satisfactory, but while these are steps in the right direction, the great problem affecting these industries still remains unsolved. Continuing, Dr. Wagner said:

"In this connection I do not think it amiss to point out another incongruity of laws as enforced in various countries and the discrimination shows against certain products. One of the greatest wastes in this country is that of the lumber industry. The waste in that particular industry is appalling and when we recall the strenuous efforts toward conservation of our natural resources, one stands aghast at the wanton waste still going on in that industry, for wherever you see a lumber mill of large capacity you will invariably find a burner installed where such wood waste as cannot be used in the production of steam is incinerated, and millions of dollars worth of material escapes unused into the air in the form of gases.

"During the last few years an industry has been started in this country based upon the observation that cellulosic materials can be converted into reducing sugars, from which ethyl alcohol may be produced. There is only one plant in operation thus far, but the results obtained seem to indicate that this new method of producing ethyl alcohol is commercially feasible and lucrative. The cash capital invested in this plant amounts to \$1,000,000. The product obtained is of the very highest grade, practically free from fusel oils.

CHEMICAL UTILIZATION OF SOUTHERN PINE WASTE

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The following article is the dissertation covering two years work on the manufacture of pulp and paper from resinous woods. The results here outlined will revolutionize the use of these woods. This article is published exclusively by the author in the Pulp and Paper Magazine.

Practical Experiments.

A series of experiments was next undertaken on a somewhat larger scale to approach a little more closely the conditions which would be met in commercial operation. The aim was to prepare the wood in the form of chips of the ordinary pulping size, then to subject the chips to a mild preliminary steaming in dilute alkali to recover the rosin and turpentine, and finally to cook the extracted chips in stronger alkali in the usual way for pulp. The preliminary extraction was studied to determine the conditions for complete solution of the rosin and simultaneous distillation of the turpentine without too serious an attack of the wood itself. The draining of the alkali extract from the chips and the salting out of the rosin soap by subsequent addition of excess caustic soda were carried out with conservation of alkali in mind, as well as high recovery of rosin soap. The second stage of the process—the production of pulp from the extracted chips—was carried through only to note any possible deleterious effect of the preliminary steaming on the quality or yield of the final pulp. The experiments were designed to throw light on the problem of commercial feasibility rather than to establish exact practical data.

The wood studied was limited to box-face slab material. As no pulp-wood chipper was available, the cleaned slabs were reduced to chips by sawing in short lengths of about one inch and splitting as uniformly as possible. Fine material was eliminated and the chips were reduced to an average size of about $1\frac{1}{4}$ in. \times $\frac{3}{4}$ in. \times 3-32 in., the thickness (3-32 in.) being the dimension held most rigidly within narrow limits. These chips were considerably longer than the smallest commercial size, and, as penetration of wood proceeds most readily along the grain, the conditions for alkali extraction were certainly as severe as industrial practice would necessitate. The chips used in Experiment 6 were prepared from the main supply by reducing the size to approximately $1\frac{1}{4}$ in. \times $\frac{3}{4}$ in. \times 1-16 in. The main supply of chips was thoroughly mixed and a representative sample obtained for analysis by quartering and subdividing. The chips were stored in stoppered bottles to prevent loss of turpentine and moisture while the sample was used to determine the composition of the wood.

Composition of Wood.

The rosin content was determined by thoroughly extracting 25 gram portions of the very fine chips with ether in a Soxhlet extractor fitted with ground-glass connections. The rosin was finally dried to constant weight by heating in a desiccator over at 105°. Occasional rolling of the

flasks hastened the removal of the ether and Turpentine. Checks within one or two tenths of a percent were considered satisfactory.

By drying the above chips at 105° after extraction with ether, a figure was obtained representing the percentage of "actual wood"—free from moisture, rosin and turpentine. This value has been used in computing the true pulp yields.

To determine the effect on the rosin of extraction by alkali, weighed quantities of the sample chips were heated near the boiling point in dilute caustic soda solution. By repeated decantation and heating with fresh caustic, there was ensured complete saponification of the rosin and thorough washing of the chips. The combined fractions thus obtained were precipitated with acid and the rosin extracted with ether. To minimize the tendency towards emulsification of the humus and to make the operation as simple as possible, the alkaline liquor was placed in a separatory funnel, acidified with HCl or H₂SO₄, and shaken with ether while still slightly warm. The suspension of humus between the water and ether layers prevented complete removal of the lower aqueous layer, although the greater part could be drawn off directly. The clear, upper portion of the ether extract was decanted through a small plug of absorbent cotton into a second separatory funnel. The residual gelatinous humus was then washed several times by decantation with fresh ether and finally filtered on the cotton and washed with solvent. The small quantity of water was then easily removed in the second separatory and the rosin was determined in the usual way. This cycle gave values for rosin which were a few tenths of a percent lower than the direct ether figure. Possible decomposition of gums by the caustic and slight mechanical losses of rosin during recovery may explain this discrepancy. Previous tests had shown that a trace of humus was dissolved by the ether, but this amount was not enough to appreciably affect the rosin determination.

The alkali-extracted chips, after thorough washing with water, were dried, weighed and extracted with ether. Only a faint trace of resinous material was obtained on evaporation of the ether, showing that the alkali had completely dissolved the rosin. The weight of the extracted chips varied from 45 to 50 per cent. of the weight of the original wood, whereas the actual wood content was found to be over 54 per cent., as determined by direct ether extraction of the wood. The discrepancy indicates the extent of lignin decomposition by the alkali.

The percentage of volatile oils could not be accurately determined on a small scale, so the highest yield obtained in the subsequent steaming experiments had been taken as a close approximation of the true "turpentine" content of the wood.

In experiments 5 and 6, 1,500 grams of wood yielded 145 cubic centimeters of turps., weighing approximately 126 grams on the basis of 0.87 specific gravity. (Actual specific gravity—0.8743 at 15°C.) This shows that the wood contained close to 8.4 per cent. by weight of volatile oils.

The average composition of the wood supply was found to be as follows:—

Actual wood.....	54.3%
Rosin (by ether).....	32.1
Volatile oils.....	8.4
Moisture (by diff.).....	5.2

	100. %
Rosin (by NaOH).....	31.8%

The total oleoresin amounted to $32.1 + 8.4 = 40.5$ per cent, made up of 79.2 per cent rosin and 20.8 per cent volatile oils.

Apparatus.

The digester used in carrying out the extraction and cooking of the wood was made from an extra-heavy cast iron tee, 6 in. x 6 in. x 4 in. The apparatus was supported in a horizontal position by resting the flanges in two concrete yokes. The 4 in. outlet of the tee was turned upward to act as a dome for the collection of steam and turpentine vapor; this arm was also used for charging and discharging. The digester was equipped with thermometer pocket, pressure gage, and relief line controlled by a needle valve and leading to a glass condenser. An internal stirring device, consisting of a small shaft fitted with arms, allowed mixing of the contents of the digester when desired. As condensation was too great when the digester was heated by live steam, heat was furnished by two large circular gasburners.

Manipulation

The manipulation was much the same in all the experiments. For the preliminary extraction, from one to two kilograms of resinous chips were placed in the digester and covered with a measured volume of alkaline liquor, containing the desired amount of NaOH or Na_2CO_3 . It was found that considerable space had to be left for steam collection on account of the tendency towards foaming. The top flange was then securely bolted in place, all necessary connections were made and the burners started. In about an hour there was evidence of pressure and the relief line was opened to permit steam distillation of the volatile oils. The burners were controlled to maintain a fixed, low pressure (between 15 and 30 pounds) for extraction of the rosin.

Agitation was carried on continuously or intermittently to prevent local overheating and to facilitate solution of the rosin. Continuous stirring tended to fray the chips and render them less suitable for pulping.

The turpentine fractions were in most cases isolated every fifteen minutes during the relieving period. Curves are given showing the rate of evolution of the volatile oils and the changes in refractive index and specific gravity during the course of distillation for typical experiments.

After the preliminary treatment no longer yielded turpentine in measurable amounts, the burners were removed and the pressure drawn down. The digester was then inverted by rotating in its seat and the hot liquor drained through the relief line.

The "direct extract" was dark brown in color and the rosin was in perfect solution. For analytical purposes the liquor was aliquoted. This

presented some difficulties; the liquor had to be kept hot to prevent precipitation of the rosin soap and the syrupy solution was not easy to handle. Some of the aliquot portions were strengthened while hot with additional caustic soda to make the precipitation of resinate more nearly complete. On cooling, the direct extract gave bulky precipitates of fairly white rosin soap. The dark, supernatant liquors were decanted and drained through cotton or filter paper, and analyzed for unprecipitated rosin. The soap, more or less contaminated with humus and liquor, was dissolved in water and the rosin determined in the usual way.

The chips retained from one to one and a half times their weight of liquor after draining. This represented a serious loss of rosin. In order to recover most of this soap, the chips were washed by covering with hot water and boiling for some time. The "first wash liquor" was drained as before, cooled and aliquoted for determination of rosin content. The color of the solution was dark brown. No soap precipitated on cooling, although about 90 per cent. could be precipitated by strengthening moderately with caustic soda.

To further clean the chips enough to allow sampling and careful examination, the wood was washed a second time by boiling with fresh water. This "second wash liquor" contained but little rosin. In actual practice the chips would be ready for the introduction of pulping liquor after draining the first wash liquor from the digester.

The extracted chips after washing as above were discharged from the digester and allowed to dry somewhat. The chips had been appreciably softened by the alkali and darkened by partial attack of the lignin. After thorough mixing, the weight was taken and the mixture sampled. The sample was reduced to small chips and boiled with successive portions of water to remove the last traces of sodium resinate. This final washing yielded small amounts of rosin soap. The chips were then dried in the oven and extracted with ether to determine the percentage of unsaponified rosin left in the wood. This indicated the efficiency of the alkali extraction.

The sample of chips was finally dried at 105°C. and weighed giving the percentage of dry, rosin-free wood. The difference between the true wood content of the original resinous material and the weight of the wood after alkali extraction showed the extent of solution of the lignocellulose.

The second stage of the treatment was the production of pulp from the wood. The main portion of the chips, after alkali extraction and washing, was returned to the digester for the soda cook. Caustic soda solution was added to cover the chips and provide amounts of NaOH varying from 15 to 35 per cent of the weight of the wood.

A gage reading of 100 pounds was reached in 1-1½ hours. The pressure was held at this arbitrary value for about three hours to obtain satisfactory disintegration of the wood. The preliminary treatment had already dissolved some of the lignin, so the final cooking was comparatively short.

The contents of the digester were agitated by stirring frequently. Distillation was carried on at intervals to detect any further evolution of turpentine. Only a few drops were obtained, except in those cases where preliminary extraction of the rosin had been incomplete.

At the end of the cook the pressure was drawn down, the hot liquor drained off and the pulp washed thoroughly. To determine the yield, the pulp was pressed carefully sampled, and the aliquot portion dried at 105°C.

The pulp was refined in the beater, samples being taken at intervals and made into sheets.

Outline of Experiments

Experiment 1 served primarily to standardize the apparatus. 2,000 grams of wood and 7,000 c.c. of liquor allowed about 1,000 c.c. free space in the dome of the digester for steam collection. This was found to be insufficient, due to surging over of the alkaline liquor. Contamination of the turpentine distillate by alkali and rosin soap not only resulted in a loss of rosin but also caused more or less retention of turpentine in the aqueous layer. The chips were heated with a 3.4 per cent NaOH solution (2.6 per cent Na_2O), the total caustic being 3.2 times the amount theoretically necessary for the saponification of the rosin. A steam pressure of 20 pounds was maintained for 3.5 hours. Although the bulk of the turpentine was removed in the first hour, the fullness of the digester prevented efficient recovery of the least portions in the time allowed. On examination of the chips it was found that considerable rosin still remained unsaponified. In the soda cook a 4.1 per cent NaOH solution was used, providing a ratio of Na_2O to wood of 24 per cent. A pressure of 100 pounds for $2\frac{1}{2}$ hours failed to give proper disintegration of the wood fibre.

In Experiment 2 the digester was filled only about two-thirds full and a very small excess of caustic soda (1.6 times theory) was used. Distillation was carried on at 30-40 pounds in an attempt to hasten the evolution of the turpentine. After two hours the fractions became very small and steaming was discontinued at the end of 3 hours. Conditions for turpentine evolution were particularly favorable on account of the large free space left in the digester and there was no contamination of the distillate. However, the yield of crude turpentine (41.3 gals. per cord) was lower than in subsequent runs and a large proportion of the rosin was left in the chips in the free state. Titration of the liquors showed that the caustic had been completely neutralized during the preliminary extraction, which explained the imperfect penetration of the wood. This pointed to the necessity of employing a larger excess of alkali in order to take care of neutralization by the humic acids formed. The soda cook was carried on with 2.6 per cent caustic solution. The maintenance of 120 lbs. pressure for 4 hours gave a soft pulp, the yield being 22.5 per cent of the original wood and 41.5 per cent of the actual wood contained therein.

In Experiment 3 the proportion of caustic soda was raised to a little over twice the theoretical amount for saponification and distillation of the turpentine was carried on for 4 hours at 25-30 pounds pressure. Disintegration of the rosin was sufficiently thorough to allow a high recovery of turpentine (41.6 gals. per cord), but an appreciable amount of rosin (7.8 %) remained unsaponified. Analysis of the liquor after extraction showed an absence of free caustic indicating that the proper alkali ratio had not yet been reached. The weight of the extracted chips was found to be 44.8 per cent of the original uncooked wood, so that the saponification of the lignin and other non-resinous

constituents of the wood had amounted to 9.5 per cent of the original wood or 17.5 per cent of the "actual wood". In this experiment for the first time careful attention was paid to the distribution of the rosin. The direct extract contained 66.2 per cent of the true rosin content in the form of rosin soap. By direct cooling only 72.7 per cent. of this soap was precipitated, due to the marked solubility in the faintly alkaline solution. On strengthening the liquor to 8 per cent. NaOH, however, 96 per cent of the soap was deposited, representing 63.5 per cent of the total rosin in the wood. The first wash liquor contained 11.7 per cent of the total rosin and the second wash liquor an additional 2.9 per cent. The chips retained 7.8 per cent of the rosin in the free state and about 3 per cent more in the form of soap which had escaped the first two washings. A small amount of soap was found in the aqueous distillate, while the balance (about 7 per cent) represented decomposition by the alkali and slight mechanical losses. Final steaming of the chips in 5.4 per cent. NaOH for $3\frac{1}{2}$ hours yielded 41 per cent. of soft, thoroughly disintegrated pulp.

To determine the effect of stronger caustic soda, a ratio of 4.34 was used in Experiment 4. Extraction of rosin was in this case complete and the recovery of the turpentine was accomplished more quickly. A large excess of NaOH remained after extraction and this experiment probably represents the upper limit as far as alkali to wood is concerned. The direct extract contained 77.2 per cent of the total rosin, 97 per cent of which was precipitated as soap on addition of excess caustic soda. Only 0.15 per cent. of the rosin content of the wood remained unsaponified in the chips. The stronger caustic occasioned solution of 24.1 per cent. of the actual wood content. The second stage of the process gave a yield of 41.8 per cent pulp, the fibre being still softer than desired.

Experiment 5 is undoubtedly the most typical of the series. A lower ratio of Na_2O (3.47) was found to be entirely satisfactory. The main extraction was carried on at the lower pressure of 15 pounds and an examination of the turpentine curve in Figure 2 will show that higher pressures are apparently not necessary in obtaining rapid distillation of the volatile oils. The time under pressure was purposely lengthened to 4 hours and the pressure finally raised to 20 pounds to ensure a maximum yield of turpentine. The percentage calculated from this run has been chosen as representing the true "turpentine" content of the wood. Extraction of rosin was practically complete and considerable excess of caustic was present in the liquors. The direct extract contained 74.5 per cent of the total rosin and the first wash liquor an additional 11.2 per cent.

Special attention is called to the fact that in this experiment the chips were finally cooked according to the procedure suggested for industrial application. The main portion of the direct extract was strengthened with a calculated amount of caustic soda to precipitate the rosin soap more completely. The black supernatant liquor was then used for the soda cook. The pulp so obtained was in no way inferior to the fibres from the other runs. The yield was 46.4 per cent. of the actual wood. The pulp retained the general chip form, but was easily disintegrated by hand and after beating was readily made up into uniform sheets of favorable strength and color.

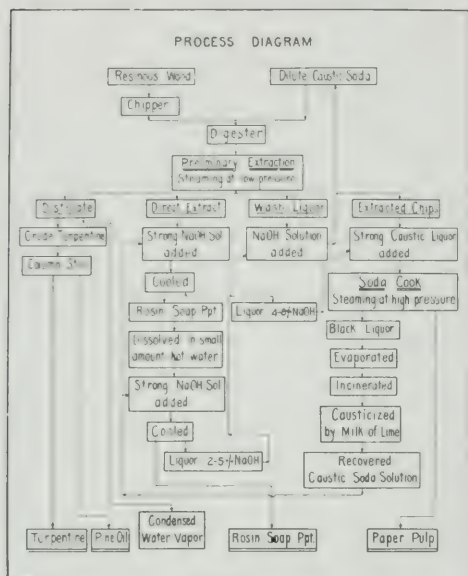
The important variable in the various runs was the ratio of alkali to wood. The unit basis for calculating the amount of NaOH or Na_2CO_3 to be used in the preliminary treatment was the weight of Na_2O theoretically necessary to saponify the rosin in the wood. Although abietic acid has a molecular weight of about 312, American rosin acts as if its "molecular weight" were close to 346. Lewkowitch, "Chemical Technology and Analysis of Oils, Fats, and Waxes," Vol. 1, p. 199. (1)

course each sample of rosin has its own saponification number, but for convenience the above figure has been taken as an approximation of the average combining weight of the rosin in the chips. This basis rosin would require 31.346 \pm 8.96 per

the decomposition products of the lignin, it seemed desirable to work towards a low alkali ratio and a low steaming pressure. A pressure of 15-20 pounds was found to be effective in achieving the most favorable results.

The time consumed in extraction varied from 3.5 to 4 hours and must in most cases be considered a maximum, because of the attempt to recover all the turpentine. The greater proportion of the run was spent in distilling the last small portions of oil. An important feature in the design of a digester for practical operation would be the provision for rapid steam distillation, so that the final portions of volatile oil could be carried over as soon as liberated by disintegration of the rosin. This would shorten the time of preliminary treatment and decrease the effect of the alkali on the rosin and the wood. A large dome or distilling head set with closed steam coils might successfully break the froth and allow proper control of distillation from the digester.

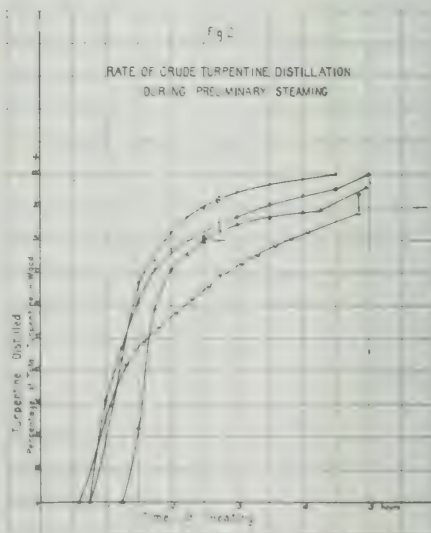
There was considerable attack of the ligno-cellulose, as may be seen from the amounts of humus, etc., dissolved (11.4-24.8 per cent of the actual wood). This decomposition of lignin seemed to depend as much on the time of contact with the alkali as on the ratio of caustic used. This action does not signify a waste of alkali or an injury to the wood, but rather represents the first stages of the ordinary pulping operation. The dissolving of the humus is objectionable only because of the extra steps of its contamination of the rosin soap and because of the extra steps involved in removing it from the same.



cent of its weight of Na_2O to produce a neutral sodium resinate. The wood under consideration contained 32.1 per cent of rosin, so that 100 parts of resinous wood required at least 2.88 parts of Na_2O for complete saponification of the rosin therein. The amounts of Na_2O actually used have been expressed as multiples of this unit value. The attempt was to find the least amount of caustic which would completely extract the rosin before neutralization, of alkali by the rosin and humic acids under conditions allowing efficient turpentine distillation and still preventing undue attack of the wood itself. With the preliminary extraction continued for 3.5-4 hours at 15-30 pounds pressure, the lower limit for NaOH was found to lie somewhere between 2.17 (Expt. 3) and 3.0

Expt. 6 times the theoretical amount of caustic. In the former case extraction was incomplete, due to premature neutralization of the caustic, while in Expt. 6 there was thorough penetration of the wood and an appreciable excess of NaOH was found in the black liquors. Under the conditions employed, the minimum amount of caustic necessary for extraction could be safely placed at about 2.5 times the theoretical value. The excess above that needed for saponification of the rosin was of course neutralized by combining with the decomposition products from the wood itself.

The refining necessary was varied somewhat but without appreciable change in the other steaming factors. The aim was to discover the lowest pressure at which distillation of turpentine and penetration of the wood could be carried on without undue lengthening the time of treatment. To obtain best contamination of the rosin extract by



Rate of Turpentine Distillation

Representative curves showing the rates of turpentine distillation are given in Figure 2. In order to compare the results on a convenient basis the values from Expts. 5 and 6 have been taken as standard and assumed to be 100 per cent of the volatile oils in the wood. All turpentine fractions in the four experiments considered have been calcu-

lated as percentage of this maximum value. The abscissas represent the total time of heating, starting from room temperature. The ordinates show the percentages of the total turpentine in the wood, which were recovered at different stages of the steaming.

The most noticeable feature is that the great bulk of the turpentine was recovered during the first stages of relieving and about as fast as the steam could carry it over. After relieving one hour, approximately 75 per cent. of the turpentine had been recovered. The last 25 per cent was evolved more slowly. With proper appliances for more rapid distillation of steam, it is quite probable that this proportion of the turpentine could be recovered in much less time. The final upward turns of the curves represent the last fractions which were carried over by the rather large quantities of steam drawn off in reducing the pressure to atmosphere. The curve for Expt. 7 shows the retardation when sodium carbonate was used. The extraction of rosin was in this case incomplete. The vertical portion of the curve indicates the turpentine fraction recovered during final cooking for pulp.

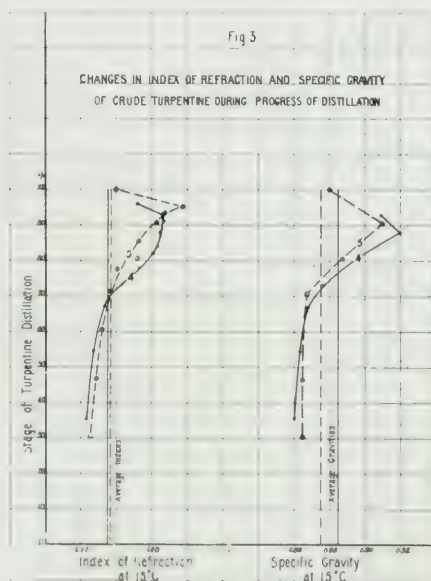
Another outstanding feature is the remarkable similarity of the curves, in spite of the differences in treating the wood. In the three experiments where caustic soda was used it will be seen that the curves almost converge at the two hour mark. This indicates that it makes little difference whether distillation is commenced as soon as pressure is evidenced or whether relieving is postponed a little.

The gradual flattening of all the curves and the marked retardation in turpentine evolution in Expt. 7, where solution of the rosin was slow and incomplete, indicate pretty clearly that disintegration of the rosin is necessary for efficient turpentine recovery. This is the difficulty experienced in the ordinary steam distillation process, where the fine resinous material must be subjected to the action of steam for 3-10 hours and even then without the recovery of the last traces of oil. In a degree, then, the curves represent the speed of alkali penetration of the wood. Evidently, an important phase of the distillation is to ensure rapid removal of the turpentine from the digester during the last stages of the steaming period, so that the operation can be discontinued as soon as the rosin is dissolved and the last of the oil thereby liberated.

The amounts of steam necessary to carry over the various turpentine fractions are important from a practical view-point. In nearly all cases the first 50 per cent. of the oil was distilled with less than its own volume of condensed water-vapor. The next 25 per cent required from 1 to 4 times its volume of aqueous distillate, the ratios in the most representative experiments (4, 5 and 6) being 1.2, 1.3, and 1.0 respectively. The fraction from 75 to 90 per cent require ratios of from 7-10 under properly regulated conditions. The figures for the final 10 per cent are now significant, because of the large amount of steam removed at the end of the treatment to ensure evolution of the last traces of turpentine. The ratios for this period varied from 40 to 50. It will be apparent that the ratios of condensed water vapor to turpentine are well within the practical limits. In fact, a much more rapid evolution of steam would be justified in order to shorten the steaming period.

The nature of the turpentine curves suggests that it might be found more economical in practice to discontinue the preliminary steaming before the last traces of turpentine were removed. This would mean a saving in steam consumption and a less severe attack of the wood itself.

In conclusion it seems reasonable to assume that a properly conducted alkali extraction will allow recovery of all the volatile oils in the wood in a high state of purity.



Partial Fractionation of Volatile Oils.

Figure 3 will serve to show certain changes in the nature of the volatile oils during the progress of distillation. The fractions were saved separately every fifteen minutes in Experiments 4 and 5 and the refractive index and specific gravity constants of each fraction were determined. The ordinates have been chosen to represent the various stages of turpentine distillation, expressed in percentages of the total turpentine content of the wood. The backward turn at the end of each curve is occasioned by the final fraction obtained while drawing down the pressure. The average constants, obtained by finally combining all the fractions, are shown by the vertical lines.

The curves of index of refraction and specific gravity for a single experiment follow closely parallel to one another. Moreover, the curves are materially the same for the two experiments. It is apparent that the oil became heavier as distillation proceeded and that the last period of steaming was spent in removing the fractions, which approach pine oil in general properties. This shows that distillation of the crude turpentine is not coincident with its liberation from the rosin, for otherwise the distillate would be uniform throughout the run. The heavier constituents are carried over more slowly by the steam and require extended treatment to ensure their recovery. This also points to the advantage of rapid steam evolution during

the last stages of the preliminary treatment in order to remove the heavier oils from the solution as quickly as possible.

The change in the nature of the oil during distillation suggests that this direct recovery might be used as a preliminary fractionation of the crude turpentine into "wood turpentine" and "pine oil."

TABLE 2

Distribution of Rosin after Alkali Extraction

[Results expressed in Percentages of Total Rosin in Original Wood—Ether Value = 32.1 per cent.]

Fraction	Form of Rosin	Experiment 4	Experiment 5	Experiment 6*	Experiment 7	Experiment 8
Dr. Ext.	Dr. Cool	48.2	70.7	65.5	59.2	53.3
Dr. Ext.	Dr. Cool	18.0	5.9	8.7	20.2	8.4
Dr. Ext.	Strengthening to 2% NaOH	63.5	75.0	72.0	76.5	59.4
Dr. Ext.	Strengthening to 4% NaOH	2.7	2.8	2.8	2.8	2.3
Dr. Ext.	Total Rosin as Soap	66.2	77.2	74.5	79.4	61.7
1st Wash Liquor	Sol. Rosin Soap	11.7	10.6	11.2	9.7	10.0
2nd Wash Liquor	Sol. Rosin Soap	2.9	3.4	2.5	2.9	4.4
Washed Chips	Unaponified Rosin	7.8	0.15	0.9	0.11	8.0
Balance		11.4	8.6	10.9	7.9	15.9

* Extraction of Smaller Chips with NaOH.

† Extraction of Larger Chips with Na₂CO₃.

Reclaiming of Rosin

Table 2 shows the distribution of the rosin content of the wood after alkali extraction and washing. The analytical results have been expressed as percentages of the total rosin in the original wood as determined by extraction with ether.

As already mentioned the direct extract was aliquoted and treated in two ways. Some portions were allowed to cool directly; others were treated with additional caustic soda to precipitate the soap more completely and leave a supernatant liquor, which would represent a solution available for the final soda cook in industrial practice. Where solution of the rosin was complete, from 75 to 79 per cent was removed in the first draining. Of this amount, from 96 to 97 per cent was recovered in the form of soap precipitate by strengthening the liquor with caustic soda up to 6-8 per cent. The sodium resinate remaining in solution was of course dependent on the solubility of the soap in the strong alkali, and on this account was practically a constant quantity—2.3 to 2.8 per cent of the total. The percentage would be relatively higher in the case of leaner woods, but the actual loss is comparatively small. This unrecovered rosin would be carried through the soda cook and would be of some advantage as fuel in the final incineration involved in the recovery of alkali from the waste pulping liquors.

The figures for direct cooling of the extract are interesting only in showing the necessity of salting out the soda with stronger caustic. The filtrate losses were high and varied inversely as the excess of alkali left in the extract after preliminary steaming. In Expt. 6, for instance, where the caustic was nearly all neutralized, the rosin remaining in solution amounted to 20.2 per cent of the total.

From 10 to 12 per cent of the rosin was removed in the first washing of the chips. This treatment must therefore be looked upon as an important step in the process. It was found that 80 or 90 per cent of this rosin soap could be recovered by precipitation with caustic. An industrial cycle might involve the salting out of the resinate in this way. An alternative would be the addition of enough caustic soda to the first wash liquor to allow its use directly as the alkali liquor for extrac-

tion of the wood in the succeeding cycle. This would permit the precipitation of the inherent resinate in the next "direct extract."

From the direct extract and the first wash liquor it was possible to recover about 85 per cent of the total rosin in the wood in the form of rosin soap precipitate, salted out of solution by means of caustic soda.

Comparatively little rosin was obtained from the second wash liquor and this step would hardly be justified in practice.

The unsaponified rosin, determined by ether extraction of the washed, dried chips, indicates the efficiency of the alkali extraction. In Expt. 3, 7.8 per cent of the rosin was left undissolved by reason of the premature neutralization of the small amount of caustic used. In Expt. 7 the sodium carbonate failed to penetrate the wood in the time allowed for steaming and 8 per cent of the rosin was retained in the free state by the chips. Experiments 4, 5 and 6 represent practically perfect extractions of rosin.

The "balance" includes 3-5 per cent of soluble resinate retained by the chips after the two washings and small quantities of soapy liquor surging over with the distillate during steaming. Mechanical losses in handling the liquors and in analysis are also involved in this figure. The main discrepancy seems to be due to decomposition occasioned by the alkali in dissolving the more or less complex resinous content of the wood.

TABLE 3

Soda Cooks for Pulp

	Experiment 1	Experiment 2	Experiment 3	Experiment 4	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Ratio of Liquor to Wood	7.5	14.0	6.7	13.5	8	16.9	6	10
Ratio of Na ₂ O to Wood	24	28	27	35	19	36	5	18
Str of Alk. Lgr. to Na ₂ O	3.2	2.0	4.17	2.6	2	4.2	1.72	1.8
Causticity of Alkali %	...	...	94	3.94	8	81	0.94	5.96
Time at 100 Pounds Pressure—Hours	2	25	4	0	3	5	3	25
Turp. Recovered Gals. per Cord	2	0	0	0	0	0	0	2
Yield of Pulp on Dry Basis—% of Res. Wt.	22	5	22	3	22	8	25	2
Yield of Pulp on Dry Basis—% of Act Wood	11	5	41	0	11	8	16	4

* Black Liquor from Preliminary Extraction used as Cooking Solution

† Soda Cook on Smaller Chips

‡ Direct Soda Cook of Resinous Chips

Production of Pulp.

The more pertinent data on the soda cooks have been assembled in Table 3. For the sake of convenience, caustic soda was used in reducing the wood to pulp. In Expt. 5 the solution used for cooking was the black liquor from the preliminary extraction of rosin, which had been strengthened with caustic soda to salt out most of the resinate. The sulphate process would have yielded better fibre, but in these investigations there seemed no necessity of complicating the treatment by the addition of sodium sulphide.

In the first seven experiments, the chips which had been subjected to alkali extraction and washing were used as raw material. In Expt. 8 a single steaming of the wood was employed. The pressure was held at about 30 pounds for 3 hours in order to disintegrate the rosin and to distil the turpentine without decomposition thereof. The pressure was then raised to 100 pounds for final pulping.

The first two ratios—liquor wood and Na₂O wood—are based on the dry weight of the extracted chips in Expts. 1-7, and on the weight of the original resinous wood in Expt. 8.

"Causticity" refers to the ratio of the sodium oxide present in the cooking liquor in the form of NaOH over the total amount present both as NaOH and Na_2CO_3 .

The pulp was dried at 105°C. and the yield calculated first as percentage of the original resinous wood to show the over-all yield, and second as percentage of actual dry rosin-free wood in the original material, to indicate the true efficiency of the pulping operation.

The turpentine figures refer in the first 7 experiments to the additional recovery during the soda cook, signifying in several cases incomplete disintegration of the oleoresin in the preliminary treatment. In Expt. 8 the turpentine was obtained by a combined extraction and pulping of the wood.

The actual data are in many ways not comparable with those in ordinary soda-mill practice. The "liquor wood" ratio is usually from 4 to 6, when a digester is filled with chips and flooded with liquor. Because of the decreased volume of the wood after preliminary extraction, a larger ratio of cooking solution was necessary to properly fill the experimental digester and prevent exposure of the chips. With lean woods the Na_2O ratio is usually from 17 to 25 per cent and the actual consumption of NaOH about 15 per cent., equivalent to about 15 per cent of Na_2O . By reason of the partial attack of the lignin in the preliminary extraction, a ratio of sodium oxide below 20 per cent was found to be most satisfactory. The above considerations necessitated a low strength of cooking liquor—lower than would be necessary in practice. A concentration of 5-10 per cent NaOH is usually employed in practice.

The pressures used in soda cooking vary from 75 to 150 pounds, the higher values applying particularly to deciduous woods, such as poplar and basswood. In these experiments a pressure of 100 pounds was chosen as a satisfactory figure for pine. The time necessary to reduce the pine to pulp was comparatively short due to partial decomposition during preliminary steaming and also to the more effective action in the small digester.

The outstanding feature of the several experiments was that there was no failure in obtaining strong, long-fibred pulp of good quality. The preliminary extraction did not detract to any noticeable degree from the quality of the final fibre. The soundness of the raw material and the use of large chips was of course largely responsible for the favorable nature of the pulp. In Expts. 2, 3, 4 and 8 the pulp was quite thoroughly disintegrated by the stirring device and the fibre was "soft." It will be seen that low yield is coincident with soft fibre. In Expt. 5 the pulp retained the chip form but yielded to disintegration on handling. Expt. 6 gave a strong pulp from the smaller chips. Expt. 7 represents a "raw" cook, in which the pulp was blown in the form of firm chips. Careful reduction in the beater gave a fibre of dark brown color and considerable strength, although the insufficient cooking had left the fibre somewhat "woody."

The over-all yield of approximately 25 per cent of pulp illustrates the practical drawback in treating this resinous material directly for pulp alone, not to mention the high consumption of alkali which would be involved in dissolving the rosin and the mechanical difficulties in cooking and washing. The true pulp yields are well within the range of ordinary practice. The figures between 45 and 50 per cent must be considered as most typical.

inasmuch as the raw material is especially adapted to the production of somewhat raw, strong fibre for making high-grade wrapping papers, etc.

Nature of Products

Turpentine: (1) As regards the character of the crude turpentine obtained during alkali extraction, it is apparent that the product represents the volatile oils of the wood practically unchanged by distillation from dilute alkali at low steam pressures. In the refining of the crude turps. from the "Steam Distillation" process, it is customary to redistil after the addition of dilute alkali. It may be said, then, that the volatile oils from the alkali extraction process have already undergone the first step in refining.

The direct product was in every case clear and only faintly yellowish in color. The oil was without the objectionable odor of "Destructive Distillation" turpentine. The odor was pleasant and of an "essential oil" character, rather than of pure turpentine. This may be ascribed to the pine oil content.

It was not considered necessary to give particular attention to the refining of the crude turpentine. The methods have been carefully worked out and there are no special difficulties involved. (see U. S. Dept. Agric., Forest Service Bull. 105 and Bur. Chem. Bull. 159). Separation into "wood turpentine" and "pine oil" would be accomplished by redistilling with steam, preferably in a column still. The final yield of turpentine, boiling between 155 and 185°C., can be placed at 70-85 per cent, the balance being pine oil boiling above 185°. The turpentine fraction would undoubtedly contain a small quantity of dipentene as impurity, although this amount should be smaller than by direct steam distillation of the wood, where the higher temperatures cause partial decomposition of the oils into dipentene. Pine oil is almost as valuable as turpentine, so that there would be very little waste in purifying the original crude oil.

Rosin Soap. (2) The proposed scheme provides for the recovery of rosin from the direct extract and first wash liquor by salting out the rosin soap with caustic soda. It has been shown that 75-85 per cent of the rosin can be obtained in this way from rich wood. The soap precipitates were soft, and more or less contaminated with material derived from the wood itself. Purification from the humus was accomplished by reprecipitations with caustic soda. The soft soap was not successfully filtered and pressed, and for this reason retained appreciable amounts of alkali liquor.

It would seem logical to use the soap as such, without acidifying to liberate free rosin. Rosin soap has marked detergent properties and is a constituent of many commercial soaps. The soap maker, however, usually incorporates the rosin by neutralizing the excess of free alkali with the free rosin acids, after saponification of the fats. Rosin soap is also used in many lubricating greases.

One of the most reasonable applications is to be found in a paper mill itself. All ordinary papers are sized with rosin, added to the beaters in the form of soap solution and finally precipitated by alum. By dissolving the soap precipitates obtained in the process under discussion, and heating with a certain amount of free rosin, it should not be difficult to provide an emulsion of the composition demanded by the paper maker.

There are possible drawbacks in a scheme of this kind. The presence of oils in size sometimes results in spotting of the finished paper. However, by careful distillation of the crude turpentine during extraction of the wood, it is doubtful if more than a trace of oily matter would find its way into the finished size. The humus carried down by the colloidal sodium resinate detracts somewhat from the white color of the rosin soap and gives a brownish color to the solutions. It is a question whether the small proportion of humus in the original rosin soap would appreciably affect the value of the directly prepared size, except for use on white papers. Humic salts have even been suggested as possible sizing agents in themselves.

E. Rinman, *Svensk Kemiisk Tidskrift*, see J. Soc. Chem. Ind., Feb. 29, 1912, p. 183). At any rate, reprecipitation with caustic soda offers a convenient method of purification.

Paper Pulp. 3. In addition to the products mentioned above, it has been shown that the normal yield of high-grade pulp can be obtained from resinous pine by the methods described. The whole process, in fact, has been designed with this end in view. The two-stage treatment adapts itself to the employment of any of the so-called "alkaline" processes for final production of fibre. It would not be desirable to use "sulphate" liquor for extraction of the rosin, but in a sulphate mill, where the two-stage treatment of rich wood was carried on in conjunction with ordinary pulping operations on lean wood, there should be no difficulty in providing for the preliminary extraction of the rich wood with caustic soda alone. As a source of alkali for cooking, the strengthened black liquor from the "direct extract" was found to be satisfactory.

The pulp obtained from long-leaf pine is characterized by unusual length of fibre, the length being 4-6 millimeters, or about twice that of spruce fibre. This quality, coupled with the favorable strength and flexibility of the fibre, imparts to the finished paper unusual toughness and resistance to folding and bursting.

The soda cooks gave brown pulp, which did not lend itself readily to bleaching. The consumption of bleach was high and the final color was distinctly yellowish. As has already been mentioned, the sulphate process is preferable where bleached pulp is desired.

The pulp from long-leaf pine is well suited for making high-grade wrapping paper, board stock, etc. With further study of the methods for cooking, sorting and bleaching, it is expected that the uses of the pulp will be greatly extended.

Significance of Results.

The data obtained in these investigations are not claimed to be exactly representative of those which would hold in industrial practice. The experiments were carried out on too small a scale to justify such a conclusion. Furthermore, there was a limitation in the kinds of southern pine waste examined. The box-type slab material was a soft grade waste, the wood being clean and sound and containing proportions of rosin and turpentine close to the upper limit for long-leaf pine. However, an important consideration in this connection is that the pulp most presented almost the maximum difficulties as far as complete extraction of rosin and turpentine was concerned.

The prime deduction from the experimental results is the feasibility of a two-stage treatment for the chemical utilization of waste southern pine. It was possible to obtain a high recovery of valuable products from the primary constituents of the wood. The crude products were isolated in a favorable state of purity and required little subsequent refining. The process was characterized by simplicity in manipulation and in separation of end products. Moreover, the materials used in the reduction, as well as the ultimate products themselves, were few in number and simple in nature.

There was no waste of alkali at any point. The portion withdrawn from the cycle in the form of precipitated sodium resinate served to enhance the value of the rosin fraction. Incineration of the waste pulping liquor provides for the recovery of the balance of the alkali, within the practical limits of mechanical efficiency.

As mentioned before, practical application of this treatment of the more resinous materials could be carried on most conveniently as a supplement to ordinary pulp-mill operation on lean wood. Only slight modifications in certain of the existing digester units would be necessary to take care of the richer grades of pine. The supply of fat wood could be obtained by sorting the raw material received at the pulp mill or by procuring lightwood, etc. from independent sources.

There is also a possibility that the first stage of the process, namely that of extraction with caustic soda or sodium carbonate, could be employed in treating those grades of resinous waste which would not lend themselves to final pulping. Charred or unsound wood might be steamed with dilute alkali for the recovery of rosin and turpentine, without provision for treatment of the extracted chips. The economic merits of such a scheme could only be decided by actual trial.

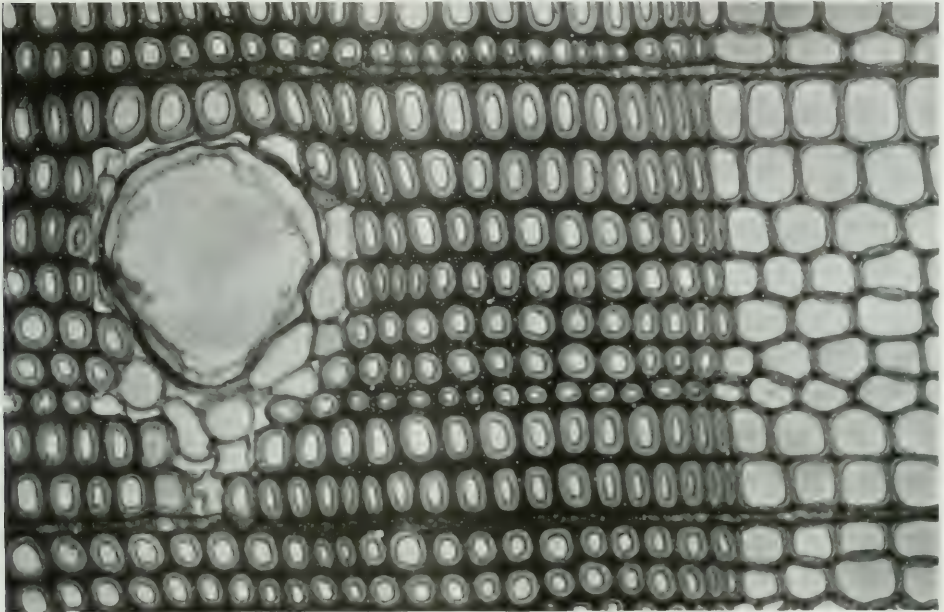
NEW BRUNSWICK'S LUMBER OUTLOOK.

The importance of the lumber industry to St. John and the Province of New Brunswick generally is shown by the extent of the exports for the year 1913. While there has been some falling off in the quantity of lumber cut during the last few years, it has been due to market conditions instead of to any falling off in the available sources of supply. Spruce is still king but some pine is cut, as well as hemlock and cedar, and a considerable quantity of hardwood. The new Transcontinental Railway, and the International Railway, which runs across the northern part of the province, have opened up very valuable sections of hardwood timber, including birch, maple and beech. The total exports of lumber from New Brunswick to trans-Atlantic ports last year was over 270,000,000 feet, of which over \$6,500,000 feet was shipped from the port of St. John. There was also large shipments to the United States, some by water and some by rail. The shipments from St. John to the American market for the year were valued at \$1,527,000. The quantity of pulp shipped from St. John to that market for the year was valued at over \$328,000, and the pulp-wood at over \$85,000. There is a growing trade in New Brunswick lumber with the Montreal district and Eastern Ontario, and during last year, when other markets are dull, this was an important branch of the trade in the northern section of the province.

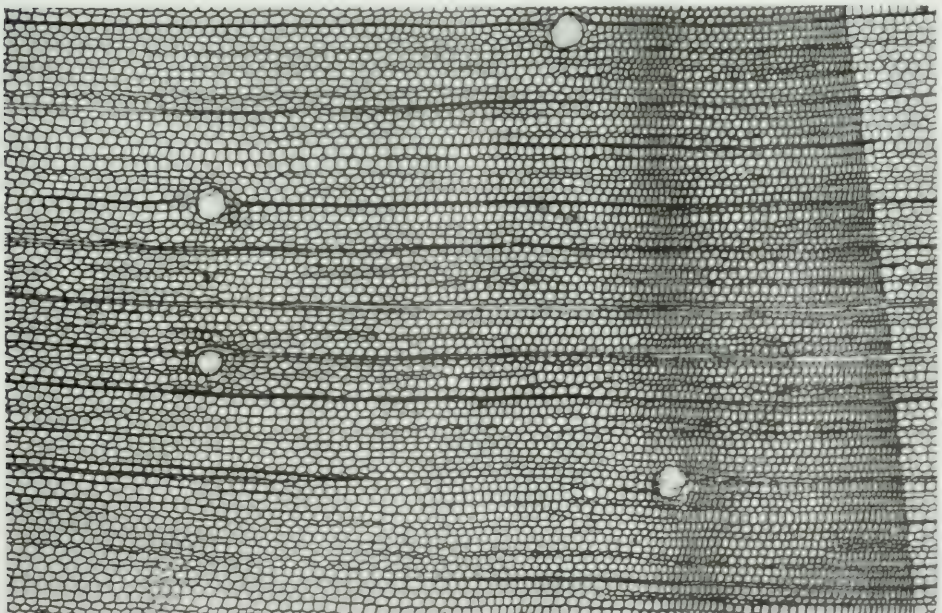
Micro. Photographs of Paper Making Woods---PINE

Made under the direction of H. D. TIEMANS, U.S. Forest Products Laboratory, Madison, Wis.

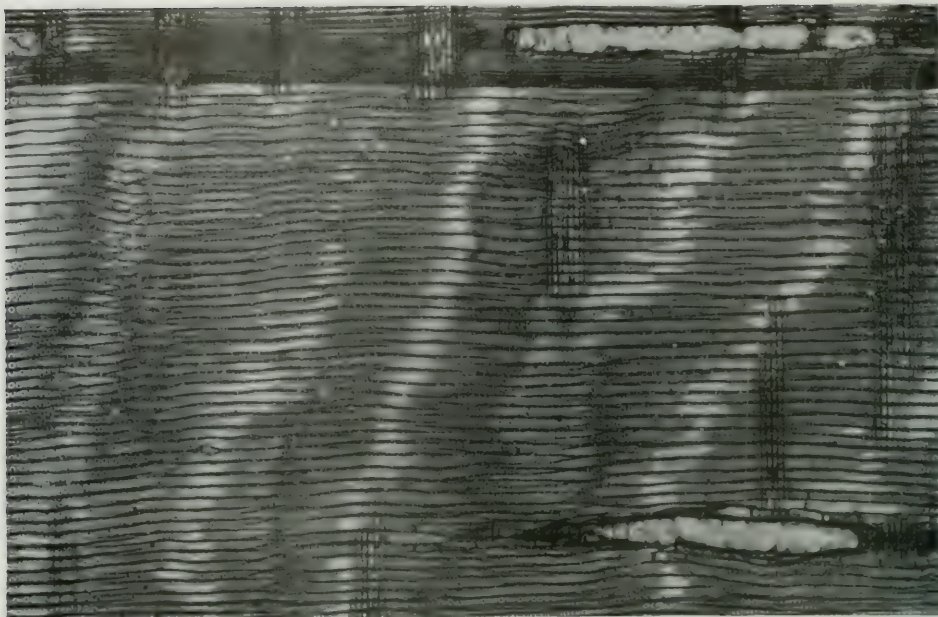
(Continued from last issue)



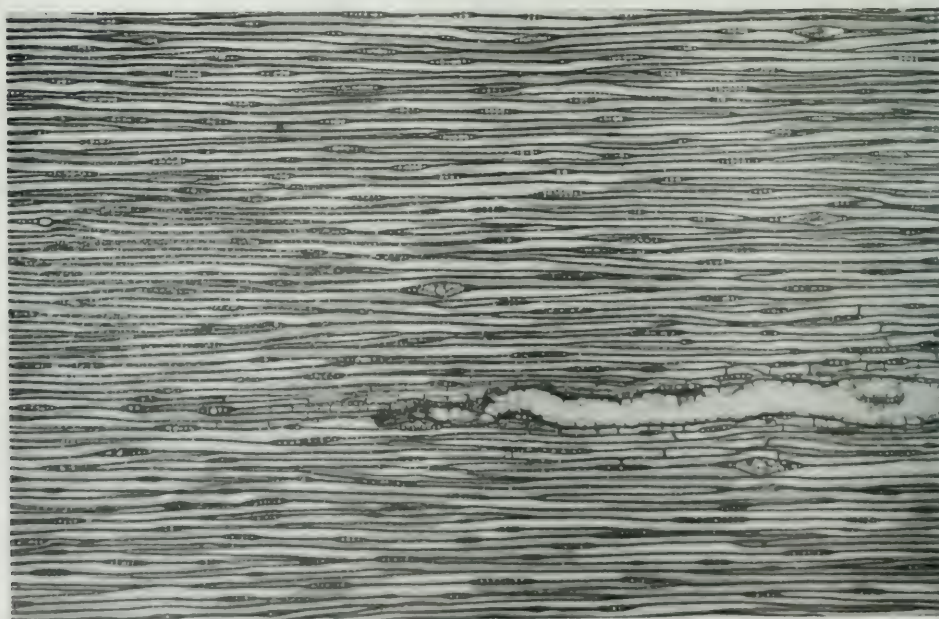
PINUS ECLUNATA- Shortleaf Pine, Transverse x 250



PINUS RESINOSA,—Norway Pine Transverse x 50



PINUS RESINOSA -Norway Pine, Radial x 50



PINUS RESINOSA -Norway Pine, Tangential x 50.

Conservation Commission Recommendations.

Ottawa, Jan. 25.—A number of important recommendations affecting the forestry interests of Canada were passed at the fifth annual meeting of the Conservation Commission, which took place in the capital last week on the 20th and 21st and was the most important event of the month in pulp and paper circles. Forestry topics as usual were extensively discussed and the necessity of taking the forestry service out of politics; of preventing the settlement of lands suited rather for timber growing than agriculture; of more efficient fire protection and larger appropriations for the work generally as well as increases in the reserves, was emphasised by means of reports and recommendations.

The report, possibly, of greatest interest to the pulp and paper trade, was that presented by Dr. B. E. Fernow—dean of the faculty of forestry of Toronto University and the expert whose report on pulpwood and agricultural conditions in the great Clay Belt of Northern Ontario at last year's meeting of the Commission caused so much comment—on conditions in the Trent Valley watershed in Ontario. The report indicated that serious consequences had followed the agricultural settlement of this district, which was chiefly non-agricultural in nature. The soil having quickly become impoverished from cultivation, the people who remained on the poorer lands were existing under undesirable economic conditions. The report indicated that only 15,000 people inhabited the 2,100 square miles of the watershed and that scarcely 10 per cent of the region had been cleared for farm purposes. Run down and abandoned farms were to be found in great numbers and were being sold for taxes at 6 cents per acre. Practically all the pine had been removed, the whole area having been burned over once, and 150,000 acres being practically a desert. It has been found, however, that enough poplar-birch remains to warrant the adoption of a policy of conservation and Dominion, provincial or municipal ownership has been suggested as well as the re-possessing by the province of the cut-over lands, the imposing of restrictions on limit holders, tending to protect the forest growth; the appointment of a forester and the perfecting of a fire-protection organization. The destruction of the forest, it was emphasized, was having a very detrimental effect on the water supply of the Trent Canal.

That Canada has probably not more than one-fifth to one-fourth as much saw timber as the United States was a statement contained in a report by Mr. Clyde Leavitt, chief forester of the Commission, in which he pointed out that Canadians had been accustomed to read about the depletion of the forests of the great republic to the South with a feeling of smug satisfaction that our own forests were quite inexhaustible. Of recent years, however, said Mr. Leavitt, there had been a disillusionment and it was now fairly well known that our forest resources had been greatly over-estimated, and that instead of being able to supply the United States after her timber will have been exhausted, Canada had, as a matter of fact, not more than one-fifth to one-fourth as much saw-timber as the United States. The Commission of Conservation was resolutely attacking the problem of a careful stocktaking of forest resources in Canada where the ground to be covered was enormous.

Nova Scotia had already been surveyed. In British Columbia information was being collected relative to the territory south of the Railway Belt through co-operative arrangements with the Provincial Forest Branch and the Canadian Pacific Railway. In Saskatchewan the district west of Prince Albert was being surveyed in co-operation with the Dominion Forestry Branch. Mr. Leavitt recommended that province having control of its natural resources begin an investigation as to the amount of standing timber, forest reproduction and rate of growth.

The Committee on Forests presented a report on forest fire protection which showed that conditions were rapidly improving. The railway companies during 1913 had shown a more sympathetic attitude toward this work. As regards provincially chartered railways, however, new legislation was needed in Nova Scotia, New Brunswick and Alberta and as regards the latter it might be said that the system of fire-protection, neither on the National Transcontinental nor the Intercolonial was as intensive as on privately owned railway lines subject to the Railway Commission.

Hon. Clifford Sifton, chairman of the Commission, in his opening address, emphasized the necessity of taking the forestry service out of the realm of politics as political appointees did not make efficient rangers. The following recommendations were then passed:

That the matter of fire protection along Government railways be further taken up with the Dominion Government and that, if possible, such railways be made subject to the fire regulations prescribed by the Board of Railway Commissioners for lines subject to its jurisdiction.

That representations be made to the Governments of Nova Scotia, New Brunswick, Ontario and Alberta, urging that both legislative and administrative provision be made for requiring provincially chartered railways to take adequate steps to safeguard the adjacent country from fires due to railway causes.

The execution of forestry projects already under way and recommended, including the investigation of forest resources and forest conditions in British Columbia and Saskatchewan, would require an addition to the existing appropriation of not less than \$10,000, assuming that, in addition, the same amount can be set aside for forestry work, from the regular appropriation as has been made available during the current year.

That favorable action be urged upon the Dominion Government relative to the proposed addition to the forest reserves of 20,980 square miles of land.

That the results of the investigation be forwarded to the Government of Ontario and the Government of the Dominion.

That the attention of the Dominion and Provincial Governments be again drawn to the vital necessity of withholding from settlement all lands which cannot be properly classed as agricultural, and of settling such lands apart for the permanent production of timber supplies. The importance should be especially accentuated of reserving and protecting from fire the vast areas of young forest growth in order that they may reach merchantable size and form a future source of local revenue and industry.

That the Dominion Government be strongly urged to place the field force of the Forestry Branch under Civil Service regulations.

That representations be made to the Dominion Government looking toward the adoption of some plan whereby adequate provision may be made for the enforcement of the technical provisions affecting lumbering operations on the licensed timber berths.

Lumber, pulp and paper and their prices were considered by the Commission on the Cost of Living—recently created by the Dominion Government—last week. Mr. R. H. Campbell, Director of Forestry of the Interior Department, appeared as a witness before the Commission and gave evidence as to the growth and manufacture, sale, importation and exportation of timber and its products. Particular attention was paid to the question of waste in production and manufacture and something was said, it is understood, as to the probable effect of the new Underwood tariff.

That pulpwood to about twenty times the value of that exported from the Ottawa Valley to the United States in 1912 was shipped across in 1913 was indicated by figures compiled by Hon. J. G. Foster, United States Consul in Ottawa, for his Government. The total value of the commodity exported in 1913 was \$77,378.27 as compared with \$3,141.00 in the previous year. The total export of all timber, however, was slightly less.

These figures are for the calendar year of 1913. Figures covering the export and import to the United States of pulp and paper from all Canada during the fiscal year of 1913 were recently issued by the Trade and Commerce Department and show a decided increase both in imports and exports. The total amount of wood pulp from the United States in 1913, according to these figures, was \$191,345 as compared with \$49,991 in 1912. The total imports of paper were \$5,754,156 as compared with \$4,221,220 in 1912. The export to the United States of wood blocks for pulp was \$6,806,945 in 1913 as compared with \$5,697,901 in 1912. The exports of paper showed a remarkable increase, the figures being \$4,390,144 in 1913 and \$2,086,394 in 1912. Of the total export of paper, printing paper was the largest item, amounting to \$424,298 in 1913 as compared with \$1,989,863 in 1912. Of paper imports, manufactures of paper, N.O.P., amounted to \$1,787,319 compared with \$1,284,467 the previous year and wrapping paper, \$1,368,466 compared with \$916,445 in 1912.

The contract has been awarded for the construction of the new home of the Methodist Book & Publishing House which will be erected at the corner of Queen West and John Streets, Toronto. The ultimate intention is to erect a ten storey building but to begin with a five storey structure will be put up. The edifice will have a frontage of 153 feet along Queen Street, 220 feet along John and 199 feet along Richmond Street. When fully completed the building and site will cost in the neighborhood of a million dollars and will be one of the finest publishing houses on the American continent. The contractors are John H. Parker, Canadian, Limited, of New York.

Toronto News.

Special to Pulp & Paper Magazine.

The Gardner Basket Company, Limited, with head offices in St. Catharines, Ontario, and a share capital of \$45,000, have been granted a charter. The company are empowered to manufacture boxes and baskets and other products of wood. The incorporators are Robert Thompson and Charles Edwin Secord, of Grantham; Arthur Onslow, of Niagara; John H. Brodrick, of Louth; and William A. Gardner, of St. Catharines.

A charter has been granted to the Aird-Island Logging and Trading Company, Limited, with head offices at Spanish Mills, Algoma, and a share capital of ten thousand dollars. The company are empowered to purchase, acquire and hold timber lands, timber licenses and rights to cut timber and to deal in logs and wood products of every description as well as to erect and operate saw mills.

The annual convention of the Beaver Companies was recently held in Thorold, Ontario. Over seventy representatives of the company came by special train and were warmly welcomed by E. R. Lowe, the Thorold manager, and C. A. Moyle, resident engineer, and conducted over the plant in which the machinery is now being installed. Afterwards all were entertained at lunch in the dining room of the mill. The visitors were later taken through the new plant, of the Montrose Paper Co. under the direction of T. A. Weldon. It is expected that the works of the Beaver Board Co., in Thorold will be in operation about the first of April. The wood fibre machine for the making of beaver board from pure wood fibre is the longest of its kind in the world and has sixty dryers each of six tons which means that the rolls of the machine will represent a weight of 360 tons. The machine, which is being erected on the second storey of the main building, was an object of great interest to the party. The immense dryer rolls are lifted in position with a six and a half ton crane. President W. F. MacGlashan, General Production Manager F. S. Rodgers, and General Sales Manager J. F. Haggerty accompanied the delegation.

The death occurred in Weston, Ont., on January 24th, of James R. Barber, who passed away as a result of a seizure of apoplexy, in the sixty-eighth year of his age. He was a brother of John R. Barber, the widely-known Canadian paper manufacturer, and a son of the late James Barber, of William Barber & Bros., who built the Georgetown Paper Mills and later the Canada Coating Mills at Georgetown. The deceased, with J. F. Ellis, of Toronto, was the founder of the Barber-Ellis Co. who have warehouses in Toronto, Winnipeg and Vancouver, and a large envelope factory at Brantford, Ontario. This company was formed in 1876, but James Barber retired a few years later and had since been living retired at the residence of his father-in-law, N. M. Livingstone, in Weston. The father of the subject of this reference was one of the first paper-makers in Canada, having practical experience in the old paper mill at Crooks' Hollow, Ontario, and in the middle fifties went to Georgetown where the brothers took over the mill that had been established by David Forbes, the firm being known as William Barber & Bros. which continued in business until a couple of years ago when they disposed of all their interests in Georgetown to the Barber Paper & Coating Mills Co., Limited. The late James Barber, who has just passed away, was

held in very high regard by the trade and leaves a widow, three sisters and one brother, John R. Barber, of Georgetown.

The staff of Spanish River Pulp & Paper Co., are now installed in their new offices in the Tyrell building, 95-97 King St. E., Toronto. M. E. Staver, President, and T. H. Watson, Managing Director, were at Sault Ste. Marie last week attending the monthly meeting of the Board of Directors.

During the past few days many representatives of labor and capital have waited upon the members of the Ontario cabinet with objections against the proposed Workmen's Compensation. P. W. Ellis, of Toronto, on behalf of the Canadian Manufacturers' Association, presented a long list of objections to the proposed bill, some twenty in number, saying that the scale of compensation (fifty-five per cent. of a man's wages) was altogether too high and out of proportion to what is allowed in all other countries where similar legislation is in force. It was contended by the manufacturers that pensions for permanent disability were absurd and that a man who lost his finger would, under the act, get a life pension. Compensation, it was urged, should not be paid to workmen who are injured by willful and intentional acts of fellow workmen. The labor men, on the other hand, agree with the principles of the draft bill as recommended by Sir William Meredith, the Commissioner, who was appointed by the Ontario Government to make full inquiries and investigation. It does not go as far as the labor bodies desire but they are willing to accept it as a compromise. If the scale of compensation remains as suggested they object to giving up the rights of recovery at common law. They also contend that there should be no maximum compensation fixed and a man should be fully compensated for any injury that he receives in the course of his employment. It is possible, before the bill passes the Legislature, that there will be compromises on both sides. The measure is arousing much interest among the pulp and paper manufacturers as well as among the lumbermen of the province of Ontario.

The construction of the Welland Ship Canal, which will mean much to the pulp and paper of St. Catharines, Merriton, Thorold and other towns was endorsed by the Executive of the Great Waterways, Union of Western Ontario, at a meeting held last week in Berlin, when a resolution was passed expressing appreciation of the federal government in undertaking so promptly and energetically the construction of the canal as a link in a large ocean to the Great Lakes waterways and urging that the same energetic policy be adopted towards the speedy development and completion of the entire great national waterway. In the matter of the Georgian Bay canal objection was taken to its construction and a resolution was passed urging that Western Ontario and the Pacific provinces receive full representation on the proposed Royal Commission to investigate the commercial facilities of the canal and such investigation be made to cover the entire route from Georgian Bay to Montreal.

It would appear as if Manitoba is coming to the front in a pulp and paper sense. Recently a report on the waterway power potentialities of the province was completed by the water power branch of the Interior Department. The Central Pulp and Paper Co., Limited, has just been granted a provincial charter with a share capital of \$200,000, divided

into 20,000 shares of ten dollars each and head office in Winnipeg. The concern is empowered to manufacture and deal in paper and pulp of all kinds and the incorporators are J. S. Hughes, R. P. Fournier, George W. Rawlings, K. C. Bradley and A. Gofton, all of Winnipeg. The Celtic Flax Co., Limited has also been granted a charter with a share capital of \$350,000 to manufacture and deal in flax and to carry on business as importers of all kinds of paper. The head office is in Beausejour. Among the incorporators are Jas. C. Scott, Winnipeg; Jas. L. Turner, Ed. A. Dugard, John Watson, Joseph Shaw, jr; Jas. D. Crawford and others of Beausejour.

Alex. Annandale, late assistant to F.J. Campbell, General Manager of the Canada Paper Co., Windsor Mills, Que., has joined the Staff of Price Bros., Jonquiere, Que., where he will act in the position of mechanical advisor. Mr. Annandale has had an extended and thorough experience in the paper mills of Scotland, England, Italy, Canada, and other countries, and has many friends among the trade.

J. F. Ellis, of the Barber-Ellis Co., Toronto, has returned from an extended trip to Winnipeg, Saskatoon, Regina, Medicine Hat, Edmonton, Calgary, Moose Jaw and other points. He was accompanied to several points by Wallace Murphy, manager of the Winnipeg warehouse of the firm and reports that business conditions in the west are rapidly improving and there need be no fear about the future. Lorne Graham, who with his brother, Garfield Graham, is joint manager of the Vancouver warehouse of the Barber-Ellis Co. and has been spending a few days in Toronto and points east, has returned home.

At the annual meeting of the Barber-Ellis Co., Toronto, held recently, satisfactory reports were presented for the past year showing a gratifying gain in business. The company's factory in Brantford turned out over 320,000,000 envelopes during 1913, while a very large business was done in the various lines of papeteries, fancy and plain, which the company produce. The old officers were re-elected: President, John R. Barber; Vice-President, and Treasurer, J. F. Ellis; Secretary, H. Holt; Directors, F. M. Ellis and C. G. Ellis, Brantford. As announced monthly, the capital stock of the company has been increased from \$125,000 to \$500,000.

The interests of the Ontario Paper Co. have organized the Ontario Transportation and Pulp Co. to build and operate boats, etc., and to do a general pulpwood business. They will supply the paper mill at Thorold with pulpwood.

The beater room floor of the Toronto Paper Co., collapsed last week. The damage is now repaired and the beaters turning out full capacity.

Mr. Wallace W. Ruthven, manager of the Empire Paper Box Company of Montreal, died suddenly in the Royal Victoria Hospital. He had been taken to the hospital as an emergency case, having collapsed and become unconscious while driving on the mountain road with his daughter, Mrs. Malcolm D. Barclay. He did not recover consciousness after his sudden turn for the worse.

By the first of April, or a little more than two months from now, the pulp mills of the Wayagamack Pulp and Paper Co., will be turning out 125 tons a day of sulphite pulp. This is considerable of a jump from its initial output some months ago of only fifty tons of pulp a day.

The third unit has been installed in the paper mills. The latter are now turning out sixty tons of fine "Kraft" paper a day. This is an increase of ten tons over the mills' output a few months ago. The total installation consists of the first installation of two 25-ton units; and a third unit for the manufacture of the finer grades, recently placed in operation.

Harry F. Donahue, who came to Montreal last March to become sales manager for the Howard Smith Paper Mills, Ltd., of this city, has resigned his connection there and returned to the States. Mr. Donahue prior to coming to Montreal was for seven years a member of the sales force of Riegel & Co., Inc., Philadelphia, where he was looked upon as one of the ablest and most popular salesmen in the fine paper line.

The lumbering conditions in the Province of New Brunswick are excellent at the present time, according to Mr. Jones, of the Partington Co. Their cut will be smaller, however, owing to the fact that there was a two years' supply on hand last year. The cut this year will be less than half the usual amount. The plant consumes about 18,000,000 feet of pulp wood in the manufacture of its product each year.

A new spur track from the Canadian Pacific Railway [to the mill has just been completed and is about a quarter of a mile long. Heretofore the company has used automobiles for transporting the pulp over this distance to the cars, but now that will be done away with. There has also been a new storehouse erected, which is 150 feet long and 35 feet wide. A conveyor connects the mill with the loading platforms at the storehouse and the pulp is delivered from the mill right to the car doors.

INCREASE IN RATE ON PULPWOOD HAS BEEN SANCTIONED.

The Railway Commission has issued judgment approving of the proposed increase of one-half cent in the various classes of local rates for pulpwood on the Temiscouata Railway in Quebec. The Intercolonial Railway is also affected by the judgment, as on the movement of pulpwood over the Temiscouata it has hitherto included in its tariffs rates from Temiscouata Railway stations. The increases are authorized, but in order not to interfere with existing contracts, will not become effective until August 15th. They amount to 2 cent on each of the tariffs for four groups, as follows: St. Modeste to Whitworth, 17 1-2 mile siding to Vauhan; 35 mile siding to Hayes; and Notre Dame Du Lac to Connors. The matter was brought up as a result of the protest of the Eastern Townships Lumber Company, Limited, against these increases.

A CLOSE TO NATURE CALENDAR.

From the Capital Wire Cloth and Manufacturing Co., Ltd., of Ottawa, Canada, comes a calendar for the month of January, 1914, which is the first one of a series of twelve close-to-nature pictures. The company intends sending to its friends and patrons one of these interesting picture calendars each month for the year of 1914.

Judging from the one just received which is entitled "In the Northland," and which is reproduced from the original painting by R. H. Collins, the monthly arrival of these calendars will be eagerly looked forward to.

ANNUAL MEETING, AMERICAN PULP & PAPER ASSOCIATION.

(Special to Pulp & Paper Magazine.)

New York, Jan. 25th, 1914.

The American Paper & Pulp Association, 50 Church Street, has just issued notices of its thirty-seventh annual convention and banquet which will cover a period of two days, beginning on the morning of February 18th and lasting through the evening of the nineteenth, when the annual banquet will be held. The convention and banquet as usual will take place at the Waldorf-Astoria, 5th Ave. and 34th Street this city, where also the various divisions will meet. February 18th will be devoted to meetings of the different divisions of the association and any changes or suggestions as to trade customs, etc., may be adopted by each division and ratified by the general meeting, to be held on the following day. It is the earnest desire of the Executive Council that there be full attendance on both days, so matters of vital interest and importance to the trade may be the more thoroughly discussed and acted upon.

The Banquet Committee has arranged for their affair to be held at 7 o'clock Thursday evening, February 19th, and they have decided to limit the number of tickets to 500, thus leaving the attendance limited to the members and their guests. Attached to each notice of the entire affair is an application blank for seats at the banquet. The committee on banquet arrangements is anxious to get all applications with the remittance of \$7.50 instead of \$10.00 as in previous years for each person, at an early date, in order to enable them to make proper seating arrangements and avoid duplication of invitations.

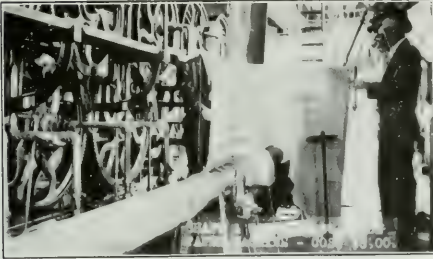
The Ticket Committee will make final seating arrangements on Monday, February 15th, and it is imperative that all applications be in the office of the Association, 50 Church Street, on or before that day. It is the desire of the committee to give each applicant the number of tickets he desires, but it may be necessary to curtail the number, in which case (and the same rule will be applied to each applicant), any money received for tickets not issued will be returned to the sender. It is the particular desire of John S. Riegel, chairman of the Banquet Committee, that all applications be in the hands of the Banquet Committee, on arrangements of which Robert D. Carter, president of the York Haven Paper Company, is chairman.

WOOD PULP WORKERS IDLE IN NORWAY.

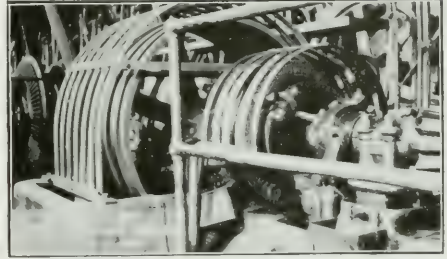
The Norwegian Employers' Association has declared a lockout against the organized laborers of Northern Norway, to take effect February 7th, unless existing troubles are settled within a week. All the wood pulp, cellulose, paper and engineering workmen are idle because of three small strikes, one in a mill near Trondheim, another in an engineering plant in Christiania and still another among the cabinet workers of Aalesund. These conflicts have lasted a long time, and according to the employers resulted from the breaking of a contract.

Prior to the introduction of syndicalism in Norway two years ago contracts were always kept, but of late contracts have been broken in several instances.

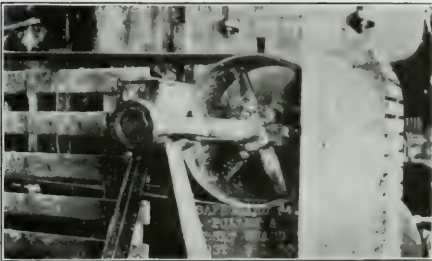
Safety in Paper Mills



Shaft and Coupling Guard on Paper Machine. Cost, \$3.00



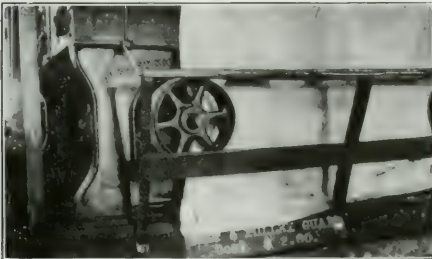
Safeguard Clutch and Pulley Guard. Cost, \$8.00



Safeguard Pulley Belt Guard. Cost, \$1.50



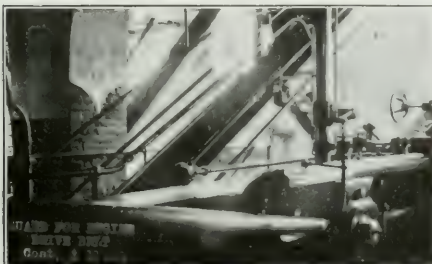
Belt and Pulley Guard. Cost, \$2.75



Belt and Pulley Guard. Cost, \$2.00



Safeguard Rolling Around Sulphur Burners. Cost, \$15.20

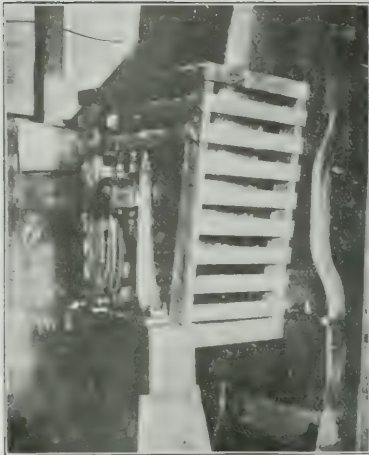


Guard for Engine Drive Belt. Cost, \$11.00



Safeguard Bevel Gear Guard Paper Machine. Cost, \$2.00

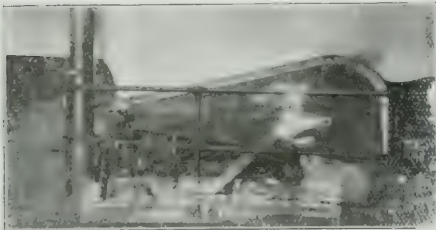
Safety in Paper Mills



Safeguard Pulley and Belt Driving Screen. Cost \$1.50



Safeguard Top Saw Guard. Cost, \$4.50



Safeguard Guard on Sprocket Wheel and Chain. Cost, \$10.85



Safeguard Gears and Pulley Guards on Paper Cutter.
Cost, \$4.50

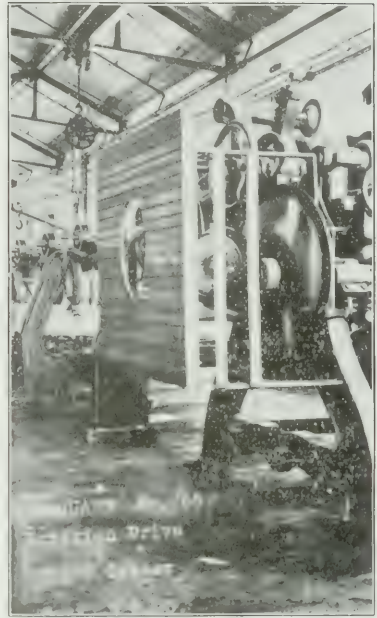


Belt Guard Screen Room. Cost, \$3.00

Safety in Paper Mills



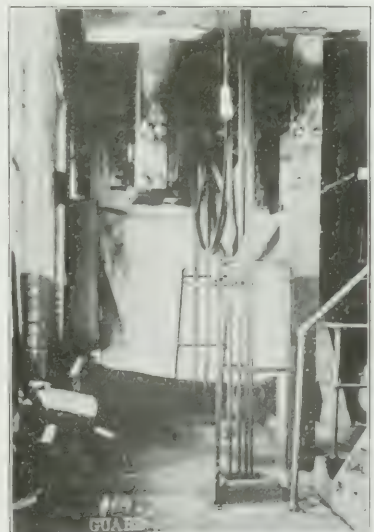
Safeguard on Band Saw. Cost, \$7.00



Safeguard Friction Drive on Paper Cutter. Cost, \$8.00



Belt and Pulley Guard—Motor. Cost, 75c.



Guard on Rope Transmission. Cost, \$4.70

A Japanese Paper Mill.



WHY may not imagination trace the noble dust of Alexander till he finds it stopping a bung-hole?" I do not know that a visit to the Omoto paper mill suggests any more useful reflection than this, but the mill is one of the examples of Japan's adoptions of Western methods, so it deserves a passing notice, though it is neither a show place nor an awful example. It is a little place on the outskirts of Kobe, with a smart new red brick factory on one side where Dunlop tyres are made under European supervision, and on the other a great corrugated-iron steel-works, but coming up to the walls of both are the too-well-manured and elaborately trenched and terraced fields of the Japanese cultivators, with their picturesque little houses and gardens. There was not much that was indigenous about the mill. Even the iron gate that opened on its cinder-paved yard was obviously English. Straight ahead, the first floor was open wide for the reception of bales of waste paper apparently from all the rubbish-heaps in the city. There was no sorting done—unless the better qualities had been abstracted before baling, for the best that was there, was torn Japanese newspapers—themselves, from a literary point of view, one of the strangest conglomerates in existence, and, from a paper-maker's standpoint, "poor whites" indeed. There were broken card-board boxes from England and America, wrappings, ~~labels~~ odds and ends from every quarter of the globe. The bales were opened up by women, and foreign bodies, such as match-boxes, string, sticks and rags were taken out when noticed, but no great care was used. Close by stood three oval tubs, about 8 by 5 feet, divided down the middle by a partition which did not quite reach the ends, and with a shaft running across the three, operating a dasher in each tub, the dasher being covered in like a paddle wheel. The scraps from all the world were heaved in by armfuls, while hot water completed the mixture. When the tub was nearly full the water was turned off, the dasher turned on, and the scraps made a procession round the tub. After a few rounds the mixture becomes a fine grade of mud, and is conducted by a pipe down to the paper-making machine, passing upwards through an open chamber on the way, where the last of the sticks and other unassimilables are caught.

Two horizontal steam-engines drive the concern, but the rope drive which operates the mixing tubs is received on a pulley which inclines several degrees, a little ellipsoidal grindstone performs curious evolutions, and as for the numerous belts that drive different parts of the paper-making machine, some are like nothing so much as a ladies' feather boa dragged and knotted. They must lose a good deal of power between them, but there is plenty of driving for the big machine, a variety of the classic fourdrinier type, in which the fine mud is poured between two endless blankets, and after several turns round cylinders, leaves the blankets and starts on a long independent journey, under cover and round a dozen more, some of them steam-heated and not too steam tight. Dry, smooth and with as much cohesion as could be expected, the final grey-brown product is wound off on skeleton drums of wood. At every few dozen

turns, the paper is slashed across by hand and taken over to the alternative drum; what is wound off is sawn through with a long knife, and the resulting sheets are laid in a pile on a low platform with half-inch cracks at regular intervals. When the pile is about eight inches thick, a cover with corresponding cracks is laid on it, and a man proceeds to cut it up, thrusting an L-shaped knife through the cracks, beyond the edge of the paper, hooking the blade underneath, and cutting upwards towards himself as he retreats over the cover. The operation is repeated crossways the whole product being reduced to about the size of handkerchiefs. One point to be noticed was that the cutters used the whetstone after every cut (not the elliptical grindstone). Tool-sharpening is distinctly a Japanese virtue. Even the most ignorant (technically) must notice the difference in this respect between Japan and India from simply visiting the hairdresser. In India the scissors and clipper are means of extraction, while in Japan they cut. But to return to our paper; the squares into which the coarse product I have been describing are cut and used for handkerchiefs, serviettes and every variety of household and toilet use. The Omoto mill is, of course, not typical of the paper industry in Japan, as some of the finest qualities are made in the country; but it is the only mill just in this neighborhood, and has a special interest as a user-up of waste. Even in finer qualities, including patterned wall paper, the same smallness of size in the finished product is usual. The number of shops devoted to the sale of packets of paper of various qualities for household use, including the papering of windows and of lanterns, is surprising. There are in all 165 paper-mills in the country, of which 99 use power. Of these 29 are for the manufacture of European paper, and employ 4,968 male and 1,528 female operators, and produce paper of the value of Rs. 2,46,00,000 annually. The Government statistics reckon those employed in the manufacture of Japanese paper by families, of whom 54,917 are engaged; these decline by nearly 2,000 a year, though the value of their product increases. The makers of European paper have increased about 80 per cent. in ten years, and the output has increased in value about 120 per cent. The "European" paper made is chiefly common printing, and is manufactured largely from imported pulp. Imports of printing paper (mainly from England and Belgium) amount to about one-eighth of the total consumption. It is a more fluctuating trade than that done in the home-made article, the explanation being that the local enterprise has not yet overtaken the minimum demand, and that fluctuations are met from a foreign supply. The import duties are high enough to make it impossible for cheap foreign printing paper to compete with the Japanese, but are not so exorbitant as to prevent the use of foreign paper when there is a demand. This brings us, of course, to the inevitable consideration whether the making of paper of the European kind is a real commercial success. The kind of which the manufacture is described above is a success, but the figures regarding the market prices of Japanese and foreign printing paper show that the former, on a free-trade basis, would be a good deal dearer than the latter. Of course, as I have said, the supply is not yet equal to the demand, so it may be that the Japanese can produce printing paper at a lower price than the European maker could supply it, but that they

take advantage of protective duties to keep up the price; the closeness of the prices seems to indicate this as the true condition of affairs.

As regards the finer qualities of printing and writing papers, import duties have done very little in the way of stimulating manufacture. Perhaps there is no great demand. The Japanese do their correspondence on flimsy paper, painting Chinese characters with a fine brush, and they send it in a long envelope of the same flimsy nature. The amount of the finer qualities of paper and card used make it hardly worth while to go in for the elaboration and expense necessary to compete for the trade.—(Special Representative of Indian Textile Journal.)

LORD NORTHCLIFFE SELLING NEWS-PAPERS.

Lord Northcliffe, newspaper publisher, has been suffering severely from weakness for some time past, and as has been cabled, been forced, on the advice of a specialist, to give up most of his newspaper responsibilities and go abroad. Several operations have been performed and Lord Northcliffe suffered intensely and his health generally is bad.

According to gossip in Fleet Street, Lord Northcliffe has got rid of all his immense newspaper holdings, including the Daily Mirror and Daily Mail, while other publications controlled by him have been acquired by his brother, Sir Harold Harmsworth, who was made a baron in the New Year's honors this week. The latter, who superintends the financial part of the Harmsworth publications, is reputed to be much more wealthy than his brother.

It is believed that Lord Northcliffe will retain control only of the Times.

QUEBEC ACTIVE IN FOREST WORK.

The Forest Service of the Province of Quebec now employs a total of sixteen professionally trained foresters.

During the summer of 1913, the Forestry Branch had fourteen parties in the field, each in charge of a technically trained forester. The work undertaken by ten of these parties was a valuation survey of unlicensed Crown timber lands. Of such lands there are approximately 125,000 square miles in the Province of Quebec. The Crown lands under license aggregate approximately 7,000 square miles. The revenue from these lands during the past year has aggregated nearly one and three quarter million dollars.

In addition to the ten parties engaged as above, four parties were engaged in an examination of licensed lands, to determine the boundaries of permanent forest reserves. It is the policy of the Quebec Government to segregate non-agricultural forests lands into permanent forest reserves as rapidly as the necessary information can be secured.

NORTHERN ISLANDS PULP WOOD CO.

An interesting action was begun in Toronto last week at the Non-Jury Assize Court, Chief Justice Falconbridge presiding, when the Imperial Bank of Canada sought to recover \$20,000 from the Detroit Sulphite Pulp Co. of Detroit, Mich. Several witnesses were heard and more evidence will be taken when the case comes up again in March next. The Imperial Bank affirms that it agreed to advance the Northern Islands Pulp Wood Co. of Port Arthur money to carry on the work of taking out pulpwood from the limits of the company on condition that all wood so cut be given in security for advances. It will be remembered that some time ago the Northern Islands Pulp Wood Co. assigned and the assignee, G. T. Clarkson, of Toronto, is calling for tenders for the assets of the company which will be received up to March 18th.

The Imperial Bank stated that the Detroit Sulphite Pulp Co., which owned the limits of the Northern Islands Pulpwood Company, had agreed to take under an arrangement in 1910, from 15,000 to 20,000 cords of pulpwood annually from the Northern Islands Co., which was given the privilege of cutting on the limits of the former concern. The Northern Islands Co. was to receive \$9 a cord. Furthermore, the Imperial Bank stated that the Detroit Company had agreed to accept all drafts drawn upon it by the Northern Islands Co. in favor of the Imperial Bank when shipments were made. In August, 1911, the plaintiff stated that shipments of some 1,550 cords were made by boat to the defendants, and, in accordance with the agreements, a draft of \$10,850 made out with bill of lading attached. Though the defendants took the wood they refused to accept the draft. A further shipment of 1,100 cords was made and a draft drawn for \$6,000, which met with a like reception. In defence the Detroit company, which admits a trustee interest in the latter, stated that though the Northern Islands Co. had acquired the privilege to cut on their limits, no agreement to buy a specified amount of pulpwood had been entered into. That if the plaintiffs had a lien on the pulpwood of the Northern Islands Co. it must be only upon 8,000 cords, and upon that cut prior to 1910, as all wood cut after that date stood as security for a loan of \$70,000 advanced by the Union Trust Co. to the Northern Islands upon the credit of the defendants. The defendants also stated that, contrary to the bank's allegations, no bills of lading had been attached to the drafts and that the plaintiff had no lien on the cargoes. The defendants stated that if the bank got a lien on the pulpwood of the Northern Islands Co. it was to pay off certain promissory notes which had been paid, that there is some \$36,000 coming to the defendants for stumpage at the rate of \$1 a cord, which, in addition to other liabilities, made a debt of \$100,000. Finally, after citing the statute of frauds in defence, the pulp company stated that the wood supplied was not up to grade and not worth \$9 a cord.

The directors of the District of Columbia Paper Manufacturing Company at Washington, D.C., declared a dividend of 1½ per cent. to stockholders of record January 15th. and payable January 20th.

The British Markets Past and Present.

By Our London Representative.

The Paper Industry.

I have waited for the production of the Trade Board returns, which were issued on January 6, before attempting to gauge an idea of what the paper industry and the pulp importations of the United Kingdom have been like in 1913. Various reports have been written on the state of these industries in the London Press and elsewhere, and I gather from them the information that "everything has been satisfactory." Paper manufacturers in various parts of the United Kingdom, however, are not of this opinion, and the Trade Board figures bear that opinion out to a nicety. From the information that reaches me from different sources, I find that the export trade of the British mills in paper and boards has been on the decline since September, when compared with 1912, and added to this are the facts that coal and materials used in the production of paper and boards are on a higher level. Prior to September trade was going satisfactorily and there was every prospect of a good year. Some mills, of course, did better than others and to make matters worse the paper manufacturers are not in a position to ask a higher price for their products in order to meet the increase in the cost of production. Roughly, there are 257 mills turning out paper and thirty-eight making boards in the United Kingdom, and commencing in Scotland I learn that, with the exception of the last three months perhaps, when slackness set in, trade was fair during the whole year. The price of coal was keenly felt and there was no advance in prices for manufactured goods except in the case of a few lines. Messrs. Alexander Price & Sons, Ltd., Aberdeen, state that the prices of raw materials, including coal, have been very high throughout 1913, but the increase in the cost of production has not yet been followed by a corresponding increase in the prices for paper, etc. Prices, however, show a tendency to firm and with a continuance of the present steady volume of trade the prospects of the coming year are very fair. In Lancashire some of the mills towards the latter part of the year showed a great scarcity in orders, but the slackness was most felt in Bradford. The head of a large firm in Bradford stated that there was a considerable falling off in trade from the very beginning of the year during the time when people were talking and writing about a boom in trade. The reason he ascribed to this slackness was the stringency in the money markets and political unrest, as a result of which very small quantities of pulp reached Bradford from Canada and Newfoundland. In London the paper market was flat up to September and from this on there was a dullness in business, with the result that agents and millmen were complaining. According to the Trade Board returns, the following figures show the state of the industry in 1913:

	1912	1913
Exports 3,329,463 3,559,317		
Imports 12,247,807 17,234,437		
	12,881,860	17,674,539

These figures include writings, printings, mill-liners, playing cards, etc., and it will be observed

that the exports of the British mills fall 52 per cent below the imports of foreign and colonial mills, the latter contributing no less than 37 per cent. in packings and wrappings. Of the exports 6,731 cwt. of writing paper in 1913 went to Canada, an increase of 770 cwt. compared with 1912; 121,649 cwt. of printing paper, a decrease of 299 cwt. compared with 1912; and 3,863 cwt. of unenumerated paper compared with 4,187 cwt. in 1912. The monthly returns for December, November, October and September show a decline in British exports of paper and boards generally. In the imports, net return is given separately for Canada, the only figure available being those of Newfoundland which show that printing paper was exported to England to the extent of 860,123 cwt., compared with 790,653 cwt. in 1912. At the time of writing I find that trade is back again to its normal level and paper manufacturers are hopeful of business brightening up during the first couple of months of 1914. They believe that a new turn of events is close at hand.

The Chemical Pulp Trade.

When the paper trade is dull it is only natural for the chemical pulp business to be featureless. That is the state of affairs just as I write, though concessions may be obtained in sulphite and sulphate by careful buyers. The prospects for 1914 are very hopeful and everything points to a fully successful year. Glancing back over 1913, I find that chemical pulps are cheaper at the end of the year than was the case at the beginning, but this is accounted for by the concessions Scandinavians have been making owing to disappointments brought about by the States tariff. Up to December 1st prices all along were very firm, but the amount of business done in the first six months of the year more than trebled that of the latter part. Towards September prices were not acceptable to buyers, and the Norwegian and Swedish mills contented themselves by waiting from July onwards for the outcome of the States tariff question. They decided not to flinch one iota and this attitude kept quotations on a high basis in the British market. At the end of the year prices became easier somewhat. According to the Trade Board returns the British demand in 1913 was as follows:

	1912	1913
	tons	tons
Chemical, dry bleached	20,101	20,621
Chemical, dry unbleached	381,496	374,684
Chemical, wet	14,797	16,498

There is a constant steady consumption of pulps in the United Kingdom and it is very gratifying to record that Canada's exports have been well maintained, but as to the actual figures I am not in a position to give them owing to the classification carried out by the Trade Board, Canada being placed under the head of "other countries." A true return, however, is made in June of Canada's trade with England. Prices of chemical pulps in the United Kingdom are about as follows today: Bleached sulphate \$52.80 to \$57, easy bleaching sulphate No. 1, \$41.70 to \$42.70, sulphate news, \$38 to \$43, unbleached soda No. 1, \$37 to \$43, unbleached soda, strong \$36 to \$38. Soda kraft, \$38.40 to \$39; all quotations c.i.f. British ports.

Mechanical Wood Pulps.

The past year has been a remarkable one for mechanical pulps, and like chemical pulps, British mills have adopted the policy of entering into contracts covering a period of several years. It is to this policy I desire particularly to draw the attention of pulp producers in Canada and they should keep in constant touch with their agents in London and Manchester with the object of capturing some of these long contracts when they expire. Canada has been in the fortunate position of getting a few good contracts, but I would like to see more going to the Dominion. Canadians can put the pulp in the British market just as cheap as the Scandinavians and Germans if they go the right way about it—and Canadian pulp is much appreciated—and a five or six years contract is worth looking after. Therefore, let us hope that 1914 will see a little more energy on the part of Canadians in the British market—particularly those who have agents to pave the way for business. Mechanical moist in 1913 fell to as low a price as \$9.12, but this was attributable to mills being well stocked and the price quoted was for prompt delivery. In the first part of the year the demand was good but the latter half saw business very dull. Generally prices at the close of the year were very much easier than was the case at the beginning of the year. Canada and Newfoundland have in 1913 taken a very prominent position in British imports of mechanical pulp, and it is to be hoped that position will now be maintained, particularly as the consumption is expanding steadily. The imports of the United are as follows in 1913:

	1912	1913
Mechanical, dry	15,788	8,967
Mechanical, wet	493,408	557,187

Of the mechanical wet in which Canada is more interested, I find that out of the total of 557,187 tons the Dominion contributed 69,090 tons, the balance going to Sweden and Norwegian manufacturers. These 69,090 tons show an increase of 26,692 tons over 1912, which is most satisfactory. If the ratio of increase in 1913 could only be kept up in 1914, in another two years the Scandinavians would find Canada an important competitor in the British market. Prices today for mechanical are about as follows: Pine 50% moist, \$10.20 to \$11 for prompt; pine dry, \$22 to \$23 for prompt. All prices c.i.f. British ports. For forward delivery add half a dollar extra.

THE MANUFACTURE OF VISCOSE.

The chemical pulp used for making viscose must be as pure as possible. According to "Der Papier Fabrikant" is must have only a small percentage of ash and contain but few constituents which are soluble in soda lye (wood gums). Chemical pulp bleached too much is very injurious owing to its percentage of oxy-cellulose, and on the other hand chemical pulp bleached too little can not be employed. Recently large chemical pulp mills have paid special attention to the manufacture of chemical pulp for making viscose.

The chemical pulp is not cleaned with hydrochloric acid or hydrofluoric acid as one sometimes

reads. The boards are first cut into handy pieces and slightly dried. The drying may not proceed too far and on no account may it cause the chemical pulp to turn yellow. The chemical pulp is first treated with soda lye. The duration of the treatment may fluctuate between thirty minutes and six hours and must be found by trial for each chemical pulp. In some works it lasts indeed twenty-four hours and longer. The saturation with soda lye takes place generally in large iron tanks filled with soda lye in which the chemical pulp weighed out in wire baskets is suspended. After the action is sufficient the excess of soda lye is removed by hydraulic pressure or by a centrifuge. The latter is to be preferred because the percentage of lye in the pulp is then more uniform. The centrifuges must be fairly large, have a high speed and consist of the best material. The middle part of the centrifuge remains free in order that the lye may be thrown out very uniformly.

After being centrifuged the chemical pulp must have rather more than three times its original weight. Quite definite limits must be maintained which are dependent on the nature of the pulp. The pulp then passes through machines which are arranged similarly to those of the well-known kneading machines, which supply a loose mass like crumbled white bread; a rise in temperature occurs which must not be too great. The mass thus obtained is left for some time, when certain temperature limits will likewise be observed, if necessary, by cooling or heating the rooms in question. The board must remain moist and the percentage of sodium carbonate should not rise too high.

For the conversion of the alkali cellulose into the xanthogenate a simple rotating drum is used in which the material is thoroughly mixed with bisulphide of carbon; 30 to 33% suffices, a larger admixture being directly injurious. Preferably the process is stopped when the product has a slight yellow or orange yellow color and is not continued until the initially loose mass becomes lumpy. Another sign for the termination of the process is given by a certain rise of temperature.

When working with bisulphide of carbon the same precautions are requisite as with benzene. During the rolling of the mass in the drum all blows and scratching movement between parts of iron must be avoided. Further, when bisulphide of carbon is inhaled poisoning readily occurs. Therefore the rooms in which bisulphide of carbon is employed must be built as large and airy as possible. The illumination must be from the outside, and when people are present both windows and doors must always be open.

The finished xanthogenate is dissolved in water of condensation or distilled water containing some soda lye. A large admixture of soda lye diminishes the viscosity.

Of the many precipitation agents sodium bisulphate, ammonium sulphate mixed with glucose, and thiosulphate come principally into question.

The Davy Pulp and Paper Co., at Thorold, Ont., are putting in a new grinder after the Voith system, a magazine that will hold twenty cords at each charging with automatic trip presses.

British Trade News.

(Special to the Pulp and Paper Magazine.)

London, January 18th, 1914.

Last week a series of mishaps befell the raw materials and the fabric of the Culter Paper Mills, near Aberdeen, Scotland. The first loss was in Aberdeen harbor, where a cargo of Esparto Grass was lying in a steamer waiting to be discharged for the mill. In the fore-hold of the vessel fire broke out and a quantity of the grass was destroyed but the remaining portion in the aft-hold escaped being damaged. This portion of the grass was removed to the mill—an old portion of the mill which is set aside for the Esparto and rags. The next mishap was in the electricity. A wire was fused and an outbreak of fire occurred, but the engineers hastily summoned the well-equipped mill fire brigade and they lost no time in extinguishing the flame. It should be mentioned that the Cutler mills are about the most up-to-date paper mills in Scotland and are electrically fitted out, in addition to other modern requirements. The last mishap occurred to the old part of the mills where the Esparto and part of the rags were. Here a fire broke out on the night of the 11th and completely destroyed the building, the damage being estimated at \$38,400 which is covered by insurance. The raw materials were destroyed, but fortunately the mill remains intact otherwise and work is proceeding apace.

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An attempt is being made by trade unionists—and paid organizers—to introduce the union label on the same principle as that adopted in America. The glowing bait is held out to the British paper manufacturer that the label will be the means of advancing the consumption of British-made paper and will also help to lessen the supply of foreign-made paper in England. In other words it is contended that the label will encourage home manufacture and home industry, and the peculiar part of the whole business is that the trade unionists who are laying out this scheme are rabid free traders, and against their principles and policy are arguing a case in favor of the protectionists. "But it is an ill wind that blows nobody good." Needless to say, paper manufacturers are all smiles on this new dictating element that has suddenly arisen and one or two newspapers look on the scheme with the seriousness of a Solomon. Of course, it would be an admirable policy for the trade unions if the paper mill owners did adopt the label, because it would leave all mills in the power of the unions and when a crisis came the mills would be at the dictation of a few agitators and a few of the "bright-boys," who could decide whether paper was to be made or not at mills. With the keen foreign competition nowadays British mills can not wait for outside interference and if they once get under the heel of the unions the industry will be turned "topsy-turvy." It may safely be assumed that this label question will cause a split amongst the members of the Paper Makers' Association, as some are in favor of giving into the men, while others are quite the opposite. How the subject will be tackled remains to be seen. There are of course mills today which

are recognized by the unions as union mills—that is trade union mills. No one can object to trade unionism as it has been carried out up to now in the mills—in some cases it has done good for the workers—but to force the views on mill owners that by using a label British paper will be protected (while the market is flooded with foreign products) and that if it is not adopted, the offending mills will be held up to "ridicule" and "exposure," (threats of the meanest order) are views that require to be dealt with in the strongest possible manner by employers.

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The Stationers Social Society have elected Mr. W. J. Whyte, a director of Messrs. Edward Lloyd, Ltd., papermakers, to occupy the position of president in 1914. Mr. Whyte will make an ideal president, as he is a man who thoroughly understands the requirements of the stationers, as well as the art of papermaking. He will make his first appearance in his new role next month at the stationers society dinner, at which the Lord Mayor of London (Sir T. Vansittart Bowater) and Lady Mayoress will be present.

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The Bradford paper mills use mostly jute, flax, hemp fibre and a fair amount of wood pulp in the year, but the fibre for the production of the paper is practically all obtained locally from a radius of within ten or fifteen miles of the city. A limited amount of cotton rag is used and practically no esparto grass. The reasons ascribed for the slackness of trade last year in Bradford are many—political conditions, which have interfered with the money markets, the revolution in China, the revolution in Mexico and the war in the Balkans. The disturbance in the Balkans has affected the markets in Germany and Austria, lessening the requirements of spinners who spin on to tubes. Hundreds of tons less of wool are being used, less tops are being combed, and consequently less paper for tops for which Bradford mills cater. Bradford mills are closely linked up with spinners, manufacturers, tube spinners and topmakers.

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In a general sense the past year has been one of difficulties and perplexities to those engaged in the rag trade. Consignors from other countries have been alarmed by the revised charges and new restrictions imposed by the railway companies and the increased cost of transit has had an appreciable effect—and undoubtedly has been the deciding factor in some cases where continental dealers had to choose between the English market and one nearer at hand. As no hopes of concessions are ever entertained it was not long before the new basis upon which business had to be transacted was clearly understood by all parties, and the same remarks apply to the higher rates for carriage. Prospects for the coming year are exceedingly difficult to gauge. The most hopeful sign is that even for the rags in least request in mills prices are firm. It is difficult to do business at the time of writing, but there is an underlying

feeling of confidence that the new year may improve trade and an average quantity may go into consumption.

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Two men, who described themselves as accountants of Ludgate Hill, London, have been arrested on a charge of conspiring together to obtain money by false pretences. A dentist living in Reading told the court that his daughter in August last, received a letter signed "C. Crumpwell & Co." offering for sale eighty preference shares in the well-known papermakers, Edward Lloyd, Ltd., upon which four months dividend had accrued to the purchaser. He agreed to buy the shares and sent "Crumpwell & Co." a cheque for \$420 for which he never received any transfer and had no further communication from "Crumpwell & Co." For a long time he considered the transaction was genuine and that the delay was attributable to the holiday season. One of the prisoners was discharged and the other was sent to the London Criminal Court to be sentenced to imprisonment.

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The half-yearly meeting of the Bury Paper Making and Manufacturing Company, Gigg Mill, Bury (Lancashire), was held recently. The report for the half-year ended November 29th, showed that there was a gross profit on trading account of £7,290 10s. 10d. After charging the account with interest, depreciation, etc., amounting to £3,082 19s. 11d., there was a credit balance of £4,207 10s. 11d. as a net result of the half-year's working. To that was added the balance from last half-year amounting to £13,260 12s. 5d., which made a disposable balance of £17,468 3s. 4d. The directors recommended a dividend of 10 per cent per annum on the 10 per cent. preference shares, ten per cent. per annum on the six per cent preference shares, and 10 per cent. per annum on the ordinary shares, plus a bonus of 2½ per cent. on the 6 per cent and ordinary shares, amounting altogether to £3,297 4s. and the carrying of a balance of £14,170 19s. 4d. to next half year's account. The meeting adopted the recommendations. Mr. James Preston, the president, and the directors of this mill deserve to be complimented on their success. Their success is an answer to the recent contention of some gentlemen in the Southern mills of England. It shows that the Northern mills are quite capable of looking after themselves in the paper market of the United Kingdom, including that of London.

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The report of Baryta, Ltd., states that the directors are glad to report satisfactory progress in the business of the company. Baryta-coated papers made under the company's processes, are now being produced on a commercial scale. The company's technical staff has been employed during the last year at the laboratory and at the factory in Germany on important work in overcoming technical difficulties inherent in all new processes of manufacture. As a result of this work perfect papers of all grades have been produced, and an interesting business is now being secured in Germany to supply baryta-coated papers to the trade, and also in ceramic papers used in the manufacturer of pottery. The installation at the company's factory at Watford, near London, is now completed and will be turning out finished photographic papers by the end of February.

United States Notes.

Secretary P. S. Ridsdale, of the American Forestry Association, has secured a ruling from the Treasury Department on the method by which the income tax on timberlands may be estimated. The Department says that office is of the opinion that "the gain from the cutting and disposal of stumpage is realized in the year during which the timber is cut and disposed of, and that the amount received in excess of the cost of such timber is profit, and should be so accounted for as income for that year." This decision was based upon the request for information pertaining to stumpage values of the yearly growth of timber, whether cut or not, and to whether an income tax, based on the value of the timberland, would or would not be assessed. It is understood that no timberland will be subject to the tax until the timber is cut and marketed.

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The Associated Dealers in Paper Mill Supplies of New York has arranged to hold its annual dinner and vaudeville in the grand ballroom of the Hotel McAlpin of New York, on Wednesday, February 18. In order to give the affair a good start, the association voted, at its January meeting, to take twenty-five tickets for distribution among honorary guests and members of the press. As preference in seating will be given to early applicants, it is important that all who expect to go, send word, together with the number of guests they have, and the fee of \$5 for each, at as early a date as possible, to either Fred H. Chase, secretary of the association, 145 Nassau Street. The committee consists of R. B. Atterbury, Fred H. Chase, James Pirnie, Daniel M. Hicks, and Adolph Salomon of 140 Nassau Street.

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The eleventh annual meeting of the National Paper Trade Association of the United States will be held at the Waldorf Astoria, Fifth Avenue, and Thirty-fourth Street, New York City, on Wednesday, February 18th, at 10 a.m. The association will hold its fourth annual banquet and vaudeville on the evening of the day of the annual meeting, February 18th, at the Waldorf Astoria, Fifth Avenue and Thirty-fourth Street, at 7 o'clock. The ladies are most cordially invited to attend, and from present indications a large number will be present. The members are also privileged to invite their friends (and their ladies) engaged in the paper business. The price of the banquet and vaudeville has been fixed at \$8 per person. The attendance last year numbered 324, and the committee is proceeding on the assumption that at least 350 tickets will be disposed of this year. Applications for tickets should be made to William C. Ridgway, Corresponding Secretary, 41 Park Row, New York City, at once, giving him the names of those who will attend and accompanied by the proper remittance check to his order. In allotting tables, it is essential that the names of those who will attend be given. The committee urgently requests that all applications be made prior to February 12th.

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The Carthage Sulphite Pulp & Paper Company of Carthage and Brownville, N. Y., has just filed complaint with the Interstate Commerce Commission at Washington against the New York Central

& Hudson River Railroad, et al, in which they charge that rates of seventeen cents, twenty-two cents and twenty-five cents on shipments of wrapping paper, box board, wood pulp board, etc., to Baltimore, Philadelphia and Richmond are excessive, unreasonable maximum rates and for reparation for past grievances.

* * *

Director Harris, of the United States Census Bureau, and William M. Steuart, chief of the Bureau of Manufacturers of the Census, listened to some severe criticisms and many suggestions from an assembly of manufacturers and trade leaders on how to conduct, compile and improve the census of manufacturers in the United States for 1914, which will be taken during 1915, at a consultation meeting held in the directors' room at the Merchants' Association of New York, last Thursday.

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Among other things, the census takers were informed that the methods pursued in the classification of past industrial surveys were most unsatisfactory to the manufacturers. Arthur C. Hastings, president of the American Pulp & Paper Association, was one of those who criticised the Federal compilations in the past as having no particular value to the pulp and paper indus (try because of the arrangement of grouping of industries. Mr. Hastings asserted that the association of which he is the head would gladly undertake the task of gathering and preparing more authentic and detailed data concerning the value of production for all the various mills throughout the United States and also the respective quantities for each grade of paper produced than the government has ever presented hithertofore. He said that business generally is now suffering from a lack of definite knowledge as to how much of our American capital has been transferred into the business abroad, and he urged that the coming census include a detailed study of the subject.

* * *

A suite for \$5,000 damages was filed in Superior Court recently by Henry H. Wilson, against the Ferdinand Funke Sons, manufacturers of paper and paper products, at Evansville, Ind. Henry and another employee in the mill, was injured October 18th. Wilson and another employee were unloading paper. They were almost through shortly before noon. John Funke, one of the defendants, and his foreman came into the ear. In order to finish up the work quickly they took hold of the bale of paper that Wilson and his partner were carrying to the door. At the door Funke and the foreman gave the bale such a hard swing that Wilson was carried along with the bale of paper. He was thrown heavily to the ground and against a stack of lumber and permanently injured.

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The John Single Paper Company, of Syracuse, N. Y., has purchased a piece of vacant property in West Jefferson Street, between Onondaga creek and West Street, upon which the company will build a four-story fireproof building next Spring. The property was owned by the American Express Company and was formerly the site of the downtown factory of the Will-Barnett Company.

I. H. Franks, London representative of Castle Gottheil & Overton, of 200 Fifth Avenue, New York, arrived in this city from England on the steamship Baltic, January 9th. Since that time Mr. Franks has been calling on friends in the trade whom he has not seen since his last trip to America three years ago. He is stopping at the Hotel Seville, where he expects to remain for the next three or four weeks. Mr. Franks in an interview with your correspondent stated that the paper stock trade in England had been very good up to a few months ago when a falling off which, he feels is probably only temporary, began. This seems to have been a reflection of the conditions existing in America at the same time. In closing, Mr. Franks said, "When the new conditions have adjusted themselves here, there will undoubtedly be a rise in business abroad, but whether this will be rapid or gradual, only the future can tell."

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Frank H. Hoberg, of Green Bay, Wis., president and general manager of the Hoberg Paper Company one of the leading paper manufacturers of Wisconsin was married quietly on January 8th to Miss Gert-rude Samuelson of Marinette, the Rev. Mr. Hummel officiating.

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Jerre C. Mosher, assistant manager of the Whiting Plover Paper Co. plant at Wis., during the past four years has tendered his resignation to take effect February 1st, 1914. Soon thereafter he will leave for New York city to open a wholesale paper establishment. Mr. Mosher is thorough in his line, and for several years before coming to Stevens Point was engaged in the paper jobbing business at Omaha, Neb.

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Solicitors Gordon and Hening to-day petitioned Court of Common Pleas No. 2 for an injunction against the Philadelphia Paper Manufacturing Company to restrain the defendants from continuing the alleged encroachment of its property in the bed of Nixon St., Twenty-first Ward. The company has a plant on Nixon St. 1,000 feet north of Fountain St. Nixon St. is a 40-foot wide thoroughfare, extending from Leverington Ave. to Port Royal Ave. When the company made recent additions and extensions to its buildings, it is averred the lines of the street were disregarded, and it built 18 feet in to the bed of Nixon St. The city maintains that this was an encroachment on and an illegal possession of a part of the streets.

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A new firm has been organized at Bellows Falls, Vt., the Standard Paper Company to make gummed papers of all grades similar to the manufacture recently established here by the Liberty Paper Co. The proprietors are A. P. Brookhouse and Rowe C. Wales. The company will occupy quarters in the building near the paper mill of the Robertson Paper Co. under the hill, formerly occupied by that corporation for making waxed papers. The two men were connected with the Liberty Paper Co. until recently.

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For the first time since the building of the immense paper mill plant in Averyville, Ill., which has recently been completed, the trade may know

who the real owners are. They are the Bemis Brothers Bag Company of St. Louis, according to a warranty deed filed in the county recorders office several days ago. The deed transfers the whole paper plant from the supposed owner Ernest B. Roberts, of Cambridge, Mass., to the Bemis Brothers for the sum of "one dollar and other good and valuable considerations and specified." Mr. Roberts it is understood, will continue as manager of the plant, which will retain the name of Illinois Paper Company and will be run as a branch business of the Bemis Bag Company in St. Louis.

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Articles of incorporation were filed with the Secretary of State Thursday by the Pawtucket Glazed Paper Company. The concern is to manufacture, buy and sell coated and glazed paper, and will be located in Pawtucket, R. I. The incorporators are Hugh Linton, Jesse Linton, Hugh E. A Linton and Carroll M. Linton, all of Pawtucket.

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M. B. Wadleigh, well-known lumberman of Old Town, Me., has brought suit against the West Branch Dam & Reservoir Co. He claims the water in the storage basin was not handled right last season delaying his logs and making extra expense. He has also sued the Katahdin Pulp & Paper Co. for \$5,000 on account of their pulp wood not being properly handled at driving time, it getting mixed with his logs and the sorting out at Lincoln made a delay and extra expense. He also drove it fifteen miles.

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The Annual Sales Convention of the Beaver Board Companies took place the week of January 5th to 10th, in Buffalo, N. Y. Sessions were held at the auditorium room of the newly enlarged Beaver Administration building. Though some of the Southern, Australian and South and Central American representatives did not attend, fully seventy salesmen were present. Service was the keynote of the convention, service to employees, sales service for distributors and dealers, and most of all, service for consumers. Plans were evolved for the extension of the service departments in every section of the Beaver organization that the Beaver companies might not only be more efficient within the organization, but of maximum value to all who handle or use Beaver Board in any way. While the entire convention looked to the future, the remarkable growth of the Beaver Board Companies during seven years was brought out clearly. One feature of the convention was a trip by special train to the new half million dollar plant at Thorold Ont. The closing of the convention was marked by a large all-Beaver banquet given at the Statler Hotel in Buffalo.

Three buildings were destroyed by fire and five firms put out of business in a blaze which occurred recently at the corner of Dundas and Sheridan Streets, Toronto. G. G. Miles' woodworking factory was one of the buildings destroyed, and all the other firms were engaged in the woodworking line. Mr. Miles was overcome by excitement when watching the fire and dropped dead.

CANADIAN PULP & PAPER ASSOCIATION TO MEET FEBRUARY 26th.

The second annual convention of the Canadian Pulp & Paper Association will be held in Montreal on Thursday, February 26th, which will be after the annual meeting of the American Pulp & Paper Association, which comes off on February 19th and 20th.

ABITIBI PULP RE-ORGANIZATION.

It is understood that a re-organization of the Abitibi Pulp & Paper Company, in which New York and Chicago capital is involved, is now on foot, and that negotiations have reached such a stage that the deal may be closed within a few days.

The St. Lawrence Pulp & Lumber Corporation is erecting a big plant which, when finished, will represent an investment of close to a million dollars. There is an irregular group of buildings, mostly one-storey and measuring something like 900 by 200 ft. in plan, forming a complete pulp mill for making high-grade bleached sulphite pulp, together with a digester building covering digesters reaching 160 ft. above the ground. It is to be finished by next September. The buildings have concrete exterior, the interior structure being largely of structural steel with yellow pine roofs.

There is to be an independent steam turbogenerator plant, giving power for both the pulp mill and a saw mill which is being erected separately. A private railroad is to supply the mill with logs from the extensive timber and pulp wood limits of the company, aggregating some 500 square miles. The Dominion Government has undertaken to develop a harbor for safe wharfage for ships up to 6,000 tons burden.

The Running Waters Commission of Quebec has deposited with the Department of Public Works at Ottawa plans for the huge dam which is to be built on the St. Maurice River to conserve the flow and thereby greatly benefit a number of pulp and paper industries on this waterway. The dam is said to be the largest of its kind built in Canada. It will be situated 2 1-3 miles above La Loutre Rapids, 40 miles from Parent and 240 miles from the St. Lawrence River. It will be 1,720 feet long, and will store 160,000,000,000 cubic feet of water, which means that it is nearly twice as large as the Assouan dam on the River Nile in Egypt. Application for approval of the plans has been made and will shortly be granted, it is probable.

Although Opposition members have charged the Government with helping to build up with its tariffs a lumber combine which has been operating in the West and putting up prices there, and although they have made every effort to draw from the Government some intimation of its tariff policy, so far none has been given. It has been announced, however, that the policy to be pursued will shortly be stated. It is understood that it will embody very few tariff changes, and that there is practically no likelihood of the paper schedules being interfered with in any way.

PULP AND PAPER NEWS

John J. Ross, General Superintendent of the Minnesota and Ontario Power Co. at International Falls, Minn., was at the Soo last week. It is rumored that he has closed an engagement with the Spanish River Pulp and Paper Mills, to take charge of their mills at the Soo, Espanola and Sturgeon Falls, Ont., but this is denied by the officials of the company. It is known, however, that the Spanish River Co. are looking for a suitable man as General Superintendent with supervision over all the plants.

W. J. Sheppard, of Waubashene, Ontario, has been elected a director of the Toronto Paper Manufacturing Co., taking the place on the Board of J. J. Sullivan, of South Brewer, Me. Mr. Sheppard who is a large shareholder in the company, is President of the Georgian Bay Lumber Co., and a Director of the Royal Bank.

The Inland Pulp and Paper Co., which was formed some time ago to take over the business and plant of the Colonial Wood Products Co., at Thorold, Ont., has started the ground wood mill again after being shut down for some time. It is reported that the Inland Pulp and Paper Co. will grind for the International Paper Co.

Benjamin J. Clark, head accountant of the Montrose Division of the St. Lawrence Paper Mills headed the polls as alderman in the recent municipal election in Thorold. T. A. Weldon, manager of the Montrose Division was strongly urged by many citizens to come out for Mayor of Thorold and was promised the position by acclamation, but had to decline owing to business reasons.

The Pulp Wood Co., a corporation under the laws of Wisconsin, has just been granted a license by the Ontario Government to purchase pulp wood lands and pulp wood timber, and to cut, carry, buy, sell and trade and deliver pulpwood in Ontario, provided that a sum not greater than ninety thousand dollars is invested in these operations. Hugh Kiefer, barrister of Port Arthur, has been appointed attorney of the Pulp Wood Company for the Province of Ontario.

The Howell Company, of Toronto, have been appointed selling agents for the Dryden Timber and Power Co. Limited, of Dryden, for New York State, Eastern Canada and Michigan. It is expected that the Dryden Company, whose evaporators are being rebuilt, will resume operations this month. The output will be forty tons per day of pure fibre sulphate pulp.

The new warehouse of the Victoria Paper and Twine Co., which is located at 439-441 Wellington Street W., Toronto, will be occupied by the company by the first of next month. The basement is already being used for storage purposes in the matter of reserve stock. The cost of the new home

of the company is \$85,000 and all the latest ideas and conveniences in warehouse construction have been incorporated in the buildings, which is four storeys high, well lighted and equipped with every time and labor saving device. The annual meeting of the Victoria Paper and Twine Co. was held at the King Edward Hotel, Toronto, on January 17th, and very gratifying were the reports presented for the past year. All the old officers and directors were re-elected. Among those present were Charles F. Hubbs, of New York, F. Jameson, of Pittsburg, George Beggs, of Rochester, Charles Corning, of Baltimore, W. H. Howe, H. J. Severance and R. W. Gallagher, of Buffalo. After the business meeting the visitors were entertained to a theatre party by Charles V. Syrett, Managing Director of the Company, and among the other guests were L. E. Charles and C. S. Nicholls, of Toronto. The new warehouse of the company was inspected and the members expressed themselves as highly pleased with it and the fine progress that had been made in construction.

William T. Johnson, who for the past few years has been managing director of the George Powley Paper Co., Toronto, has resigned.

J. O. Trounce, who has for some time past been representing D. S. Walton & Co., paper dealers, of New York City in Toronto, has joined the staff of the Continental Bag & Paper Co., and is attached to the Toronto office.

The annual Meeting of the Ratcliff Paper Co., Toronto, was held on January 17th, and the reports for the past year showed a nice advance in business over the preceding twelve months. The officers elected were: President F. L. Ratcliff; Vice-President, T. E. Gain; Secretary, Norman J. Ratcliff. An interesting social feature that took place recently was when Mr. and Mrs. F. L. Ratcliff entertained the staff of salesmen and office managers to a delightful evening at the home of the President, 145 Crescent Road. The Ratcliff Company has been in business for fifteen years and it is rumored that they may in the near future erect a large and well-equipped new paper warehouse, a site having already been selected, their present quarters at 30 West Market Street being too small to accommodate their growing business.

J. G. Whyte & Son, Limited, Ottawa, have been granted a charter with a share capital of \$95,000. The company are granted extensive powers and among them are to carry on the business of wholesale importers and vendors of stationery and smallwares, and to manufacture and deal in all kinds of books, stationery, bookbinding machinery and to publish books, etc. The company are empowered to take over and acquire as a going concern the wholesale stationery and other business now carried on in Ottawa by Robert Barclay Whyte and Leslie Patterson Whyte, under the firm name

of J. G. Whyte & Son. The incorporators are Robert Barclay Whyte, Leslie Patterson Whyte, Charles H. Schwerdfager, Horace A. Moffatt and Alfred H. Whyte.

Woodworkers, Limited, of Toronto, with a share capital of \$40,000, have been granted a charter to buy, sell and deal in timber limits, timber lands and logs and to manufacture and deal in lumber and woods of all kinds and all articles in the making of which timber or wood is required. The incorporators are Louis F. Strickland, Alex. B. Beverly, and Rudolph F. Lembke, of Toronto, Percy E. Heeney and Walter H. Gregory of Berlin, Ontario.

Brown Mechanical Pulp or "Leather" Board

The "Papier Zeitung" publishes a summary of a pamphlet by Zacharias, on the manufacture of brown mechanical (so-called "leather") boards. Dealing first with the composition of wood, it is stated that fully dried spruce wood contains approximately 53% of cellulose, 14% of other less resistant carbohydrates, including wood-gum, 29% of lignin and 4% of resin, fat and mineral matters. Treatment of the wood with hot water alone removes 12% of soluble matters, chiefly the gummy carbohydrates, but including about 2% of the lignin constituents.

The woods chiefly employed for making leather boards are the coniferous varieties of spruce, fir and pine, occasionally certain percentages of the deciduous woods, such as birch, beech and poplar are added. Birch and beech woods are harder and closer in structure than the coniferous woods, but the employment of birch-wood is not advantageous in spite of the higher yield, because it requires a more severe and longer steaming, and the pulp produced is very short and free. Beech-wood also requires a longer steaming, and the pulp has a very dark color, nevertheless it is greasy and the best leather boards are made of a mixture of two-thirds of coniferous wood with one-third of beech, because the latter gives a closer board which is harder and takes a better finish than one made entirely of spruce or pine. Poplar wood is very soft and spongy, it is easily pulped but does not improve the quality of the board.

The time and pressure of steaming must be adjusted to the nature of the wood to be ground, the quality of stuff to be made and its color. Pine-wood is most commonly employed and is steamed for about ten hours under a pressure of $3\frac{1}{2}$ to 4 atmospheres. A higher pressure is not advisable owing to the resinous nature of the wood. Fir and spruce, on the other hand, being less resinous, may be steamed under a pressure of six atmospheres for six hours, whereas birch and beech require much longer. Long steaming causes the wood to grind much greasier and the board takes

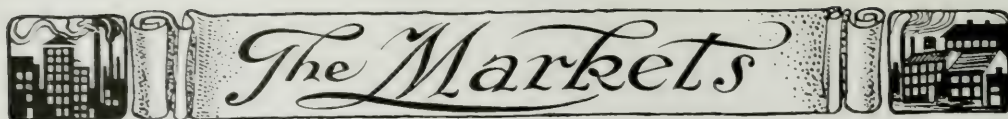
a better finish. Fresh, green or damp wood must be steamed for a longer time than dry seasoned wood. For a cubic metre of well steamed wood a consumption of 400 to 500 kilos. of steam is required. It is advisable to grind the logs shortly after steaming, as wood which has been allowed to dry up again is more difficult to grind and does not yield such a good pulp. Nevertheless, it should not be ground directly out of the boiler as the stuff then shows a great tendency to froth. As a rule the stones used for grinding steamed wood are coarser than those used for ordinary white mechanical. Brown mechanical pulp is very much stronger than white, but its color is against its general application. Paler stuff can be made by slow steaming under a pressure of 1 to $1\frac{1}{2}$ atmosphere. Also a paler color can be obtained by boiling out the wood with water under pressure in which treatment the addition of oxalic acid to the water assists the color; the greater consumption of steam by this process is compensated by the better quality of the pulp. To a certain extent the brown color of steamed wood is due to the pressure of air in the steaming chamber. The digesters may be either horizontal, vertical or rotary, the last consume more power and are not so easily insulated and wear more rapidly, but in spite of these defects they are often preferred. A very good pulp is prepared by a patent process in which the wood is alternately boiled in water and steamed under pressure; the pulp produced is superior in strength and quality to ordinary steamed pulp. Leather boards and papers made from steamed mechanical may be dyed in the pulp or surface-stained by means of basic or direct dyestuffs.—(Specially translated for the "World's Paper Trade Review.")

HOW SAMPLES OF LYE SHOULD BE OBTAINED FROM SULPHITE COOKINGS.

Probably every pulp maker is convinced that the lye is fully utilized in his works, but this is frequently a great mistake due to the samples being improperly obtained. Generally the lye is run off from the try cock into a copper beaker or a glass vessel, cooled slightly or not at all and then titrated. The SO_2 has, however, the property when heated or agitated of being changed from the liquid into the gaseous form, and as the test of lye is agitated and heated very greatly when drawn off the SO_2 for the most part escapes and cannot be found when titrating. If a digester whose total contents of SO_2 amounts to $3\frac{1}{2}$ to 4 per cent. is heated up to 100 degrees C. without letting off gas hardly more than a total of SO_2 amounting to 2 per cent. will be found.

Therefore, if it is wished to determine the correct percentage of SO_2 in the lye, connect to the try-cock an india rubber tube or a leaden worm of thin piping, whose end is provided with a cock, and place the worm in cold water. Then run off the lye cold, titrate the same, and it is surprising to find how strong the lye still is.—

Der Papierfabrikant.



Canadian Markets

The market conditions continue fair and news print is in good demand and prices firm. One mill which was looking for orders has been taken care of and the outlook for the coming season is splendid particularly from an export standpoint. Book and writing plants report that the number of orders are improving, and they are looking forward to a busier period. In spite of the fact that 1913 was in many respects a non-expensive year in trade, owing to the money stringency and the curtailment of various operations, the volume of business done by the paper houses is reported, with very few exceptions, to be ahead of the previous twelve months. There is still some price cutting in manilla fibres and krafts, but this has been going on so long that it has become a part of the trade conditions as it were, and jobbers say that there has on the whole been less during the last twelve months than in 1912. The demand for ground wood pulp is rather quiet and the sulphite situation is a little easier, owing to foreign competition. Water conditions are generally reported favorable. Most of the mills have contracts covering the major portion of their outputs for 1914. The rag and paper stock market is exceptionally quite, mixed papers and other lines being still off. Most mills have just got through taking inventories and will not enter the market for any large supplies until later in the season.

Quotations f.o.b. Toronto, are:

Paper.

News (rolls) \$42 to \$44, delivered in car load lots.
News sheet, \$44 to \$48, delivered in car load lots.
News sheet, \$53 to \$56, delivered in less than car load lots.

Book papers (carload) No. 3, 3.75c. to 4.50c.
Book paper (ton lots) No. 3, 4c. to 4.50c.
Book paper (carload) No. 2, 4.25c.
Book paper (tons lot) No. 2, 4.50c. to 5c.
Book papers (carload) No. 1, 4.75c. to 5.25c.
Book papers (ton lots) No. 1, 5.25c. to 7.50c.
Writings, 5c. to 7½c.

Sulphite Bond, 6½c. to 8½c.
Grey Browns, \$2.35 to \$2.75.
Ibex, \$3.00 to \$3.75.
Manilla B., \$2.50 to \$3.25.
Manilla No. 2, \$3.00 to \$3.50.
Manilla No. 1, \$3.00 to \$3.75.
Un glazed Kraft, \$3.75 to \$4.50.
Glazed Kraft, \$3.75 to \$5.00.

Pulp.

Ground wood (at mill) \$15 to \$16.
Ground wood, \$22 to \$24 delivered in United States.
Sulphite (unbleached), \$12 to \$14 delivered in Canada.

Sulphite (unbleached), \$43 to \$45, delivered in United States.

Sulphite (bleached), \$56 to \$58, delivered in Canada
Sulphite (bleached), \$58 to \$60, delivered in United States.

Paper Stock

No. 1 hard shavings, \$1.87½ to \$1.90.
No. 1 soft white shavings, \$1.70 to \$1.75.
No. 1 mixed shavings, 50c.
White blanks, 82½c. to 85c.
Ordinary ledger stock, \$1.20.
Heavy ledger stock, \$1.40 to \$1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c. to 50c.
No. 1 manila envelope cuttings, \$1.10 to \$1.15.
No. 1 print manilas, 65.
Folded news, 50c.
Over issues, 52½c.
No. 1 clean mixed paper, 30c. to 32½c.
Old white cotton, \$2.50 to \$2.75.
Thirds and blues, \$1.30 to \$1.32½.
No. 1 white shirt cuttings, \$5.00 to \$5.25.
Blue overall cuttings, \$3.50 to \$3.62½.
Black overall cuttings, \$1.75.
Black linings, \$1.75.
New light flannelettes, \$4.50.
Ordinary satinets, 75c.
Flock, 90c.
Tailor rags, 65c.

Quotations f.o.b. Montreal are:

Book and News Paper.

Roll News, \$41 to \$43 per ton for large orders;
\$45 to \$50 per ton for small orders.
Ream News, \$45 to \$47 per ton for large orders;
\$50 to \$75 per ton for small orders.
No. 1 Book, 5½c. to 6c. per lb.
No. 2 Book, S.C., \$1.60 to \$1.75 in large quantities
\$4.75 to \$5.50 in small quantities.
No. 3 Book M.F., \$4.10 to \$4.25 in large quantities
\$4.40 to \$4.50 in small quantities.

Mostly all paper houses allow a discount of 2% to 3% for payment in 30 days.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.35; 5 tons, \$2.45; 2 tons, \$2.55; 1 ton, \$2.56; less, \$2.75.
Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05, 1 ton, \$3.15; less, \$3.25.
No. 2 Manilla, car lots, \$3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
No. 1 Manilla, car lots, \$3.35; 5 tons, \$3.45; 2 tons,

Pulp and Paper Magazine

OF CANADA

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The Knight of the Press

Most interesting developments have come to light during the past few weeks in the Montreal newspaper situation, which have had a wide effect throughout the entire Eastern part of the Dominion.

The figure around which these revelations and discussions have centered has been, Sir Hugh Graham, proprietor of the Montreal Daily Star-Witness-Telegraph-Herald et al. From the basement printer, with a few coppers, Sir Hugh Graham has developed a publishing business of enormous proportions—his largest paper, "The Montreal Star," is alone valued at two million dollars.

This phenomenal success has encouraged him to ape the roll of our famous friend, John Norris, of New York, formerly Chairman of the Committee on Paper of the American Newspaper Association.

It is a regrettable fact that the situation now made public, through the various "Graham" deals, has occurred in Canada. Up to the present time, publishers and other manufacturers have been doing business with each other on most equitable basis—each willing to concede to the other, a fair profit and reasonable consideration. This situation would never have been destroyed by the print manufacturers—all of whom have sold to Canadian consumers at a price less than obtained in the United States. They are giving the publishers of this country the benefit of the lower cost of production and raw materials, which our paper mills are enjoying temporarily—on the whole the publishers in this country have been treated most fairly and on a most business-like basis by the manufacturers of newsprint paper, but the success of Norris' methods

at Washington, has led our ambitious Knight of Newspaperdom to stir up the quiet pool.

The amalgamation of a number of papers, either in one city, or in different parts of the country, is, of course, perfectly all right when carried on on the proper basis. A newspaper, as a moulder of public opinion, cannot, however, be manipulated entirely in the interests of high finance—there must come a day when people turn against such movements. A paper depending upon the public for support, as newspapers are, must not deal carelessly with this aspect of the situation.

Now, Sir Hugh Graham proposes to amalgamate the Purchasing Departments of a number of the largest Canadian Dailies (chiefly in those which he himself and the Southam people are interested) and to purchase all their paper from one mill in one large order, claiming by this means to save money to the papers. He also puts forth the argument that it would be to an advantage to do this by being able to use a standard width of roll, but it is well known that the presses of these various papers mentioned, are not uniform, and that when Sir Hugh Graham has closed his contract with a manufacturer, he will attempt to change the width of some of the rolls, and thus let the paper-maker in for a large run of side runs, and in general, hand him the dirty end of the deal.

Sir Hugh's own statement of his reasons for interesting himself in so many papers of Montreal is as follows:

"Now as to the one national question of office room, why I am interested in other papers is because the Star

has no room in Montreal. It is a 22 in. wide pulp and paper printing machine, and it is not possible to print the Star in the United States has nothing to do with Canadian newspaper proprietors. The new plan is that the first full destruction of one pulp for

ests, by man and fire, undelayed by reforestation, must whittle away our visible supply toward an early vanishing point.

At that time the president of the *Toronto Globe*, the proprietor of the *Hamilton Spectator* and the publisher of the *Montreal Star* held a conference in Toronto and, agreeing as to the menacing outlook, took steps to inquire into the feasibility of establishing a paper mill on the Nepigon river, and engaged Thomas Pringle and Son, engineers, of Montreal, to report upon it. The report was unfavorable.

"By forestry, milling and newspaper experts I was then advised to become interested in a sufficient number of newspapers to secure an aggregate order for white paper of at least one hundred tons a day, and by inducing all the publishers to install the same sized presses the whole output of the paper mill would be of uniform size, which would reduce the cost of production to a minimum. This seemed to be the best solution of the problem of how to get a permanent and adequate supply of paper.

"This is the secret of my seeking an interest in other newspapers. In every case where I am interested I have succeeded in convincing the managers of these papers of the wisdom of joining with me in assembling the orders for paper, with a view to ultimately taking up a mill's whole output. This simply is a business policy which has commended itself to every newspaper man to whom I have presented it. Of not a single paper outside of the *Star*, which is the only paper I own, do I attempt to dictate the policy."

The above statement was given out in reply to a published statement by the Hon. W. S. Fielding, giving his reasons for retiring from the Presidency of the *Telegraph Publishing Company*. Sir Hugh Graham has always found it most difficult to keep men with any kind of a democratic spirit in his employ, and it is not exceptional the Hon. Mr. Fielding could not work in sympathy with him. Commenting on this situation, the "*Toronto Globe*" says:—

Mr. W. S. Fielding has done great service to all other working journalists and to the Press of Canada in declining the office of editorial responsibility for a newspaper venture the ultimate control of which was kept secret from himself and from the public. The newspaper situation in Montreal during recent months, its manipulations, its mergers, its mock conflicts and secret agreements, has been to honest and self-respecting men in the craft a disgust and a discouragement. The good name of journalism has been trailed in the dust. The man in the street and the man in the college were led to mock at the public Press, at its sincerity as an organ of public opinion, at the alleged subservience of men of conscience and character to the money power of private interests that dare not show their hand. To that secret, this that Mr. Fielding has done is a direct and unequivocal answer.

And it is done at real personal sacrifice. Mr. Fielding is no longer a young man. It is many years since he retired from newspaper work in Halifax. His Parliamentary life brought the rewards of honest and capable public service, but those rewards were not financial. For many years Canada's Minister of Finance, he never made material gain out of his special and rare opportunities. He went out of office as he entered office, a poor man. The editorial opportunities in Canada for a man of his standing are very few. To refuse one of the best, to refuse at knowing the cost, and to refuse it because the controlling power behind its management was kept secret, is a thing for which W. S. Fielding will be honored by every honest-minded journalist in Canada.

While neither of that secret power was pure in its motives and aims in its purposes. It was secret. Secrecy of control in the important office of the Press in the United States, controlling its independence, and making it not the servant and defender of public interests but, because secret, their most dangerous enemy. The same old offense in the beliefment of British journalism is at least public, confessed, openly avowed. The American method is secret and sinister, prostitutes to the secret private ends both the profession and the man it uses, while at the time it professes competence, honesty, and the public good. No secret motives, no protests, well explain away as possible that secret conspiracy. That the light has been thrown on the secret in Canada before as yet it may be too late to preserve the honor of Canadian journalists and journalists as a great source for which gratitude is due to the Hon. Mr. Fielding, not from his fellow-sufferers merely, but from the whole Canadian people.

The *Canadian Courier*, commenting on the situation, very aptly puts it as follows:—

Journalists all over Canada will greatly regret these events. The idea that any capitalist, however able, can hire a number of prominent writers and use them as political puppets, is one which all good journalists resent. If Sir Hugh persists in his attempt to control the editorial utterances of the *Herald-Telegraph*, *La Patrie*, and *La Presse*, in addition to those of his own paper, *The Star*, he will either drag the good name of journalism in the mud or make an ignominious failure. The Northcliffe idea cannot flourish in the fresh atmosphere of the North American continent.

The appearance of Sir Hugh Graham in the roll of conservatism under these circumstances must make the pulp and paper men smile audibly. It is well known that the paper mills in this country are the most efficient in their operation of any in the World, and while we have many wastes yet to be corrected, the correction can never come from people whose ambition is selfish aggrandizement.

A financial paper commenting on this situation, says as follows:—

"Sir Hugh Graham's endeavor to conserve the National Resources of this great Dominion of ours, by curtailment of paper consumption, stands alone as a monument of patriotic and self-sacrificing duty to the people. A small interest in the *Herald and Witness*, however, will hardly suffice to preserve more than a few hundred million feet of pulp timber annually, and it may still be necessary for our journalistic knight to buy the *Calgary Eye-opener* or the *Longueuil Trumpeter*."

The situation, however, is too serious for levity, and it behooves the pulp and paper manufacturers to take a united stand against such mis-guided devotees of the dollar as Sir Hugh Graham has proven himself to be.

Labor in Lumber Camps

It is very interesting to note that during the past winter, which has been one of industrial depression, and decreased labor market, that lumbermen have experienced the greatest difficulty in obtaining suitable labor for lumber camps. The hue and cry for labor that is heard in the large cities in Canada, where so many have been out of work during the past few months, does not ring true when we see throughout the country thousands of men needed for work of this kind, which is easily the best kind of unskilled work we have. Thousands of men have been hanging around cities filling up the bread lines and soup kitchens, when the largest industry we have in this country was sore in need of men to gather their supply of raw material to keep their mills and factories going for the next year. Every year, the difficulty renews of obtaining sufficient men to go to the woods for the logging operations. It was expected that this year on account of the abundant supply of labor this difficulty would be avoided. We find, however, that these predictions were not borne out. The ordinary labor available in Canada of foreign extraction do not seem inclined to take to this kind of work. For this reason, their pleas for employment often fall on deaf ears. Work in lum-

ber camps is undoubtedly as fine work as unskilled labor can engage in. The conditions are healthy, the food is good and it is always warm working in the woods. How much better are these conditions than what is usually found in construction camps, where men live in shacks and lean to's, with flapping tarred paper and chilly Canadian winter breezes adding to the discomfort. A campaign of some sort pointing out the advantages of this work would indeed be in the interests of lumbering and paper manufacturers.

Editorial Comment

After considerable delay, the Postmaster has announced the detailed memorandum of the Parcels Post System and put the same into effect this week. It has been decided to adopt the zone system in fixing parcels post rates on account of the large ratio of area to population in the Dominion.

The first rate is five cents for the first pound and one cent for each additional pound or fraction thereof, up to four pounds and two cents for each subsequent pound up to eleven pounds within a radius of twenty miles from the place of mailing, irrespective of provincial boundaries. This is to give local merchants an advantage within their own neighborhood and also farmers and gardeners who can use the mails for sending produce to their local market at a low rate.

A parcel of eleven pounds can be sent twenty miles for two cents a pound and this should give the farmers a decided advantage.

The system has been simplified as much as possible. For each Province there is to be a special rate card, on which the Postmasters can see at a glance what are the local rates and the charges for forwarding parcels to other Provinces, etc.

There will be seven major Provincial zones, the Maritime Provinces comprising one. In sending a parcel across the continent there will be an additional charge for each additional zone or Province through which it passes.

The introduction of this parcels post into Canada is of the greatest importance to the paper industry. With the growing use of paper containers for all kinds of merchandise, including groceries, there is no doubt that it will mean a phenomenal advance in the use of board and heavy wrappings and even in the lighter wrappings in Canada. Those, however, who expect this jump to be immediate and at first striking will, of course, be disappointed. The lag of human nature will show itself, and it will be some time before people will appreciate the value and advantages of the parcels post system. This will tend to keep the sudden consumption of these grades to a healthy and steady advance. There is a suggestion in this for paper interests in that we should take advantage of it through advertising and in selling the product. The market will not come itself, but must be solicited, and manufactur-

ers should first themselves appreciate the opportunities, and then attempt to make the consumers share their appreciation.

* * * *

The Companies Case, which was recently decided in Ottawa in favor of the E. B. Eddy Company by the majority opinion of the court, which maintained the right of provincial incorporations to do business in other provinces as well as being subject to provincial regulation and taxation, is up for attention again. Since the court was not unanimous, and because there is still much uncertainty with respect to the matter, the case is to be carried on appeal to the Judicial Committee of the Privy Council for final adjudication. Important constitutional questions are involved, and if the provincial contention is sustained, federally incorporated companies will also be subject to provincial regulations and, in fact, be little better than charters from the provinces. If the judgment is reversed, the provinces stand to lose a source of profitable revenue or, at least, have such revenue reduced. A conference of provincial premiers held in Ottawa last October asked that the case be considered closed, but it is thought best to appeal to the Privy Council to have the matter finally settled. The case is being watched with great interest, and there is no doubt that the contention of the provinces should be decided against.

* * * *

The annual gathering of the Canadian Lumbermen held in Ottawa on the 3rd inst. was the occasion of a careful discussion of lumbering conditions in this country. Mr. J. R. Booth was elected Honorary President.

A great deal of important discussion came up regarding the Workmen's Compensation Bill recently brought up in Ontario. Senator Edwards made a vigorous attack on the proposed bill, calling it socialism of the worst kind. He said that it will mean the closing of factories, the lessening of employment, and in every case it would mean that the employer would always come off second best. It is a measure of the most vicious kind, and the general opinion of the entire association was decidedly against the bill. It has been pointed out in these columns before that the bill is a menace to the pulp and paper interests as well, and we fail to see how such a bill could become law.

Another matter of interest brought out at the association was the opening of the Panama Canal. But the association was agreed that little benefit would be derived in the Canadian lumber industry by this new development. On the whole the convention of the Lumbermen's Association was extremely good and the

* * * *

A Bill has come up before the present session of the House of Commons limiting the hours of work for workmen and in public works to eight hours per day. It also stipulates that the material supplied under contracts for such works shall be manufactured under

similar conditions. This Act has, of course, been introduced at the instigation of the Labor Unions. It is by no means a fair proposition, but should be allowed to regulate itself as other work does. There will be a great deal of public work of special natures which are not covered by the clause "Extraordinary Emergency" which would require longer hours. Another great difficulty in this connection is the fact that

in towns where other industries are situated, this would cause the greatest labor difficulty by having such systems introduced. For example, in pulp mills where it is impossible to work such hours, a great deal of discontent would be aroused. It is to be hoped that this Bill will not become law, but that the matter will be allowed to adjust itself, according to the regular conditions.

THE USE OF RUMBLING BARRELS

By E. S. HOLLOWAY.

While so much to-day is being said about the conservation of our forests not only from fire, but also by the closer utilization of their products, we hear very little about remedying the wasteful methods of barking wood by knife barkers for the manufacture of pulp. It was an endeavour to ascertain whether the newer types of rumbling barkers produced satisfactory wood for the preparation of pulp that the writer visited several of the best pulp and paper mills in Canada and the United States using this type of barker, in which the bark is removed by abrasion leaving the wood intact, thus resulting not only in a saving of fibre but also in a reduction of the labour cost of barking.

It is a matter of common knowledge that the loss in preparing or barking wood by knife barkers is very heavy, usually reaching 25 to 30 per cent of the volume of the rough wood, although many tests on different types of knife barkers in some cases equipped with one of the mechanical turning attachments have given results much lower than this, and in fact, as low as 12 to 15 per cent, but it must be borne in mind that when such tests are being made the operators of the machines are aware of the fact, and consequently pay more attention to their work which brings the percentage loss down to the minimum quoted above, but we must not picture on still a low loss as this for it is an established fact that the operators are careful enough to remove only the bark, losing sight of the value of the loss of wood in their endeavour to obtain the greatest possible output from their machines, whereas by using rumblers the loss is cut down to 8 or 10 per cent being only the volume occupied by the bark—resulting in a saving of about 20 per cent of the volume of the rough wood.

So much can be said for and against the rumbler depending on the point of view of seller or buyer of wood that it is rather difficult to set at the real truth, naturally the buyer of wood wishing to obtain the cleanest wood that is available and also the greatest possible volume of solid wood per cord, against these conditions are lost obtained by purchasing roused wood, and consequently aware that roused wood is not sufficiently clean and that he can get results as much solid wood from the use of rumbler wood as from one cord of roused wood—also the second reason being more substantial and strongly in the favor of the rumbler. Increasingly times that purchased the wood is found and properly resulted in it is sufficiently clean, this is borne out by the fact that many mills are now using

rumbler on their own wood and find the products satisfactory.

The writer has seen samples of unbleached sulphite pulp made from 90 per cent rumbler and 10 per cent roused wood, which are as satisfactory as can be, being remarkably free from specks.

Such mills are reaping the double benefit of obtaining 20 per cent greater production of pulp per gross cord and being able to utilize much smaller diameter wood, which could not be barked in a knife machine due to the danger to the operator and to the enormous percentage loss of barking small stuff, this is in itself an important factor, encouraging the use of rumbler in this day of shortage and high price of pulp work, and also carries out the modern idea of conservation by utilizing the tops which would otherwise remain in the forest and increase the fire hazard.

It might be pointed out that the utilization of these tops gives a market for small diameter sticks obtained from the lopping of tops making it possible to practice lopping at a profit, and thus assisting in the fire protection of our standing forests and also assisting towards their reproduction, naturally the buyer is not so vitally concerned along these lines, but at the same time he would insure to himself a longer supply at the present price. In regard to closeness of piling, it is claimed that as much pulp can be obtained from a cord of rumbler wood as from one of roused, for the reason that in rumbled wood the sap wood is intact, and that a greater quantity of pulp can be obtained from a unit volume of sap wood than from the same volume of heart wood, however, it is the writer's opinion that, provided the rough wood entering the rumbler is of good quality and reasonably straight and well trimmed, the quantity of solid wood per cord will not materially differ from the solid content of roused wood.

For the successful operations of rumbler much depends on the natural condition of the wood, for example it is found that those tree wood barks more easily than wood which has season, some species bark easier than others, hallock being one of the easiest, much also depends on the method of bringing wood to the mill, a long drive by water has tendency to soften the bark and in the case of a rapid river much of the bark is removed while driving, permitting easy barking, but should the logs be much loosened on the drive it is difficult to bark them sufficiently as portions of bark are driven into the broomed ends producing specks in the finished paper.

There are two main types of rumbler backers, the continuous and the intermittent. The first consists of a large drum open at both ends through which passes a steady stream of either two foot or four foot wood, the interior of the drum is provided with several flanges, which act as retarders, forcing the wood to be rubbed one piece against the other and also against the interior of the drum, provision is made for the removal of the bark at the discharge end of the drum through a series of slots, water is admitted into the drum, aiding the removal of the bark, and also washing it away, a drum 47 feet long and 8 feet diameter revolving on outside supports similar to a ball mill at 8 r. p. m. and set on a slope of 1 in 15, has a capacity of 10 cords per hour, by this is meant that ten cords are completely barked, more wood than this goes through, but usually 5 to 10 per cent of the wood has to be sent through a second time in order to completely clean it. The intermittent type consists of a larger and shorter drum revolving on a 12-inch hollow shaft, through which water is admitted to the interior of the drum, charging is effected through a removable section of the drum, a drum 14 feet in diameter and 10 feet long requires 6½ cords to charge it and as 2½ hours are required to charge, bark and empty the drum, the capacity is 2½ cords per hour, about 10 per cent of this wood has got to be either sent through a second time or cleaned by hand.

The main objections to the use of rumblers are that often the ends of the sticks are broomed and during the rumbling, small particles of bark are driven into the broomed ends, and, secondly, the fibre of the wood gets crushed by striking on the projecting flanges on the inside of the drum, thus driving small particles of bark into the fibre, in the case of the continuous rumbler, it is the writer's belief that the first of these difficulties can be remedied by having openings along the whole length of the drum to get rid of the bark as soon as it is removed, and by also using copious quantities of water projected into the drum at a high velocity to aid in the losing of the bark and to wash it away, it is apparently not absolutely necessary to have projecting flanges on the inside of the drum, and if these were removed, it would remedy the second difficulty, it would probably be necessary to decrease the slope of the drum in order that the wood would remain in the drum a sufficiently long time to remove the bark, this idea is partly carried out at the Great Northern Plant at Millinocket, Me., where the drum, instead of being a continuous one, is made in several sections, set on the same driving shaft and having a gap of about 3 inches between each section, permitting the exit of the bark more quickly. The general opinion is that a drum 8 feet in diameter should be revolved at about 8 r.p.m. for the best results—higher speed than this throws the wood too much to obtain the proper rubbing effect.

It is difficult to get rid of the bark quickly in the intermittent type of machine, which the writer investigated, this machine holds the bark and wood together during the time of rumbling and it was necessary to wash out the drum after each batch had been run through.

The writer understands that there is an intermittent machine in use in which the drum is supported on a hollow shaft not running completely through it, during the rumbling, water is forced through one side and out the other, carrying the detached bark with it, however, he has not had an opportunity of studying this type of machine but understands that the results are quite satisfactory.

Taking into consideration the labour power and speed and efficiency of barking, there seems to be no doubt that the continuous machine is the most satisfactory type of rumbler as will be seen from the annexed table of performance and cost of operation.

The general consensus of opinion of the users of rumblers is that they produce entirely satisfactory wood for making ground wood pulp or for sulphite of lower grades, but for the preparation of sulphite pulp for high grade paper, they must be carefully watched to get satisfactory results, but at the same time mill operators would not be too ready to buy wood barked by rumblers, for should any defects show up in the finished product, it would be hard to locate the trouble in their own mill, as one department would throw the blame to another, and eventually the producer of the wood would have to assume the blame, but this, in the writer's opinion, is only a hypothetical objection to their more extensive use, as with careful inspection perfectly satisfactory wood can be produced at a much lower cost, and at the same time permitting the closer utilization of our forests.

It is to be hoped that we shall see more of these machines in use in the near future as they are so much more economical than the knife barker, not only in lower cost of operation, but also in their enormous saving of raw material.

Table Showing Approximate Relative Cost of Barking Including Conveying to Machine.

	Prod. 1 day	Hours	Cost/cord	Annual	Out/Cts Tret										
	Good H.P. saw	one cord	per day	Cost/Cld	out per cord										
Size	per 1000	per 1000	H.P. Labor	H.P. Labor	Cost L&D										
					Cords Cld. Cts.										
Capacity	10	20	25	3	2	5	6	1	2	1000	1000	1	5	3	
Rate (lb/ft)	2	30	10	1	12	15	3	10	12	1000	800	1200	5	3	
Old K.C.	7	3	1	12	8	2	1	3	12	300	60	1200	1	16	9
K&M T&C	1	12	1	8	2	1	1	1	12	250	70	800	8	24	2
K&M W.C.	2	18	1	5	2	6	2	1	12	750	130	1500	1	15	0
Labour	20¢	hour			Power	\$20 H.P. year				and dressed	20 hrs.				

FUEL BRICKETS FROM SULPHITE LYE.

In the beginning of October, subscriptions were invited in Sweden to form a company with a capital of \$146,667, to purchase and use Strehlenert's patent for fuel bricks of sulphite lye. A Norwegian company was, however, also bidding for the patent, and finally the two have been amalgamated. At a meeting held in Gothenburg it was decided to arrange a Norwegian-Swedish company, with a capital of \$426,667, for this purpose. Messrs. And. H. Kiaer & Co., of Fredrikstad, have undertaken to provide the greater part of the capital. The location of the company will be in Norway. Mr. Hellstrom, C.E., will join the board of directors, representing the Swedish interests. It is intended to form subsidiary companies for utilizing the process in other countries where cellulose is produced.

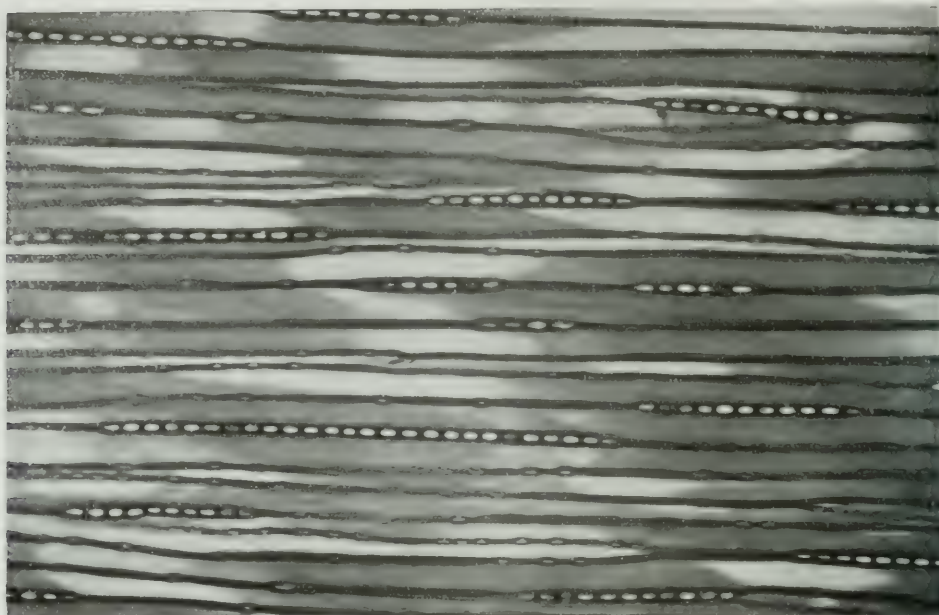
REDUCED DUTY ON NEWS PAPER INTO BELGIUM.

A Belgian law, dated August 30, 1913, provides for the reduction of duty on paper for newspapers from 4 frames to 2 frames per 100 kilos. In order to be admitted at the reduced rate, shipments of paper must fulfil the following requirements prescribed by Decree of September 13: The paper must be imported in long rolls, on reels; it must be not less than 45 centimetres wide; it must be of the quality ordinarily used for newspapers; it must be white, or only slightly tinted; it must have a rough or uncalendered surface; it must contain at least 70 per cent mechanical wood pulp and weigh not less than 45 grams nor more than 60 grams per square metre; it must not be more than half-sized. Importers must satisfy the customs authorities as to the use of the paper in the printing of newspapers.

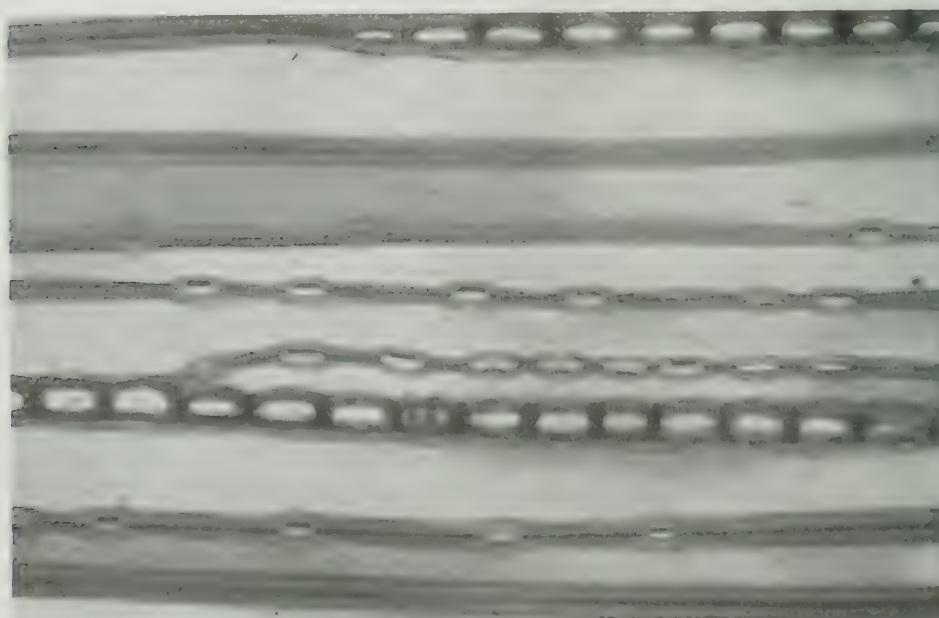
Micro. Photographs of Paper Making Woods---BALSAM FIR

Made under the direction of H. D. TIEMANS, U.S. Forest Products Laboratory, Madison, Wis.

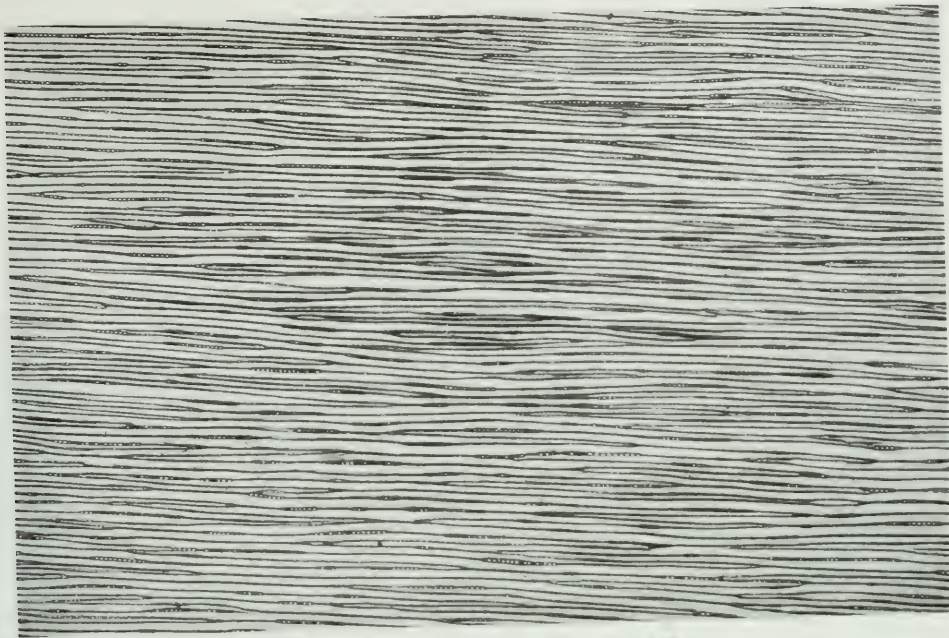
(Continued from last issue.)



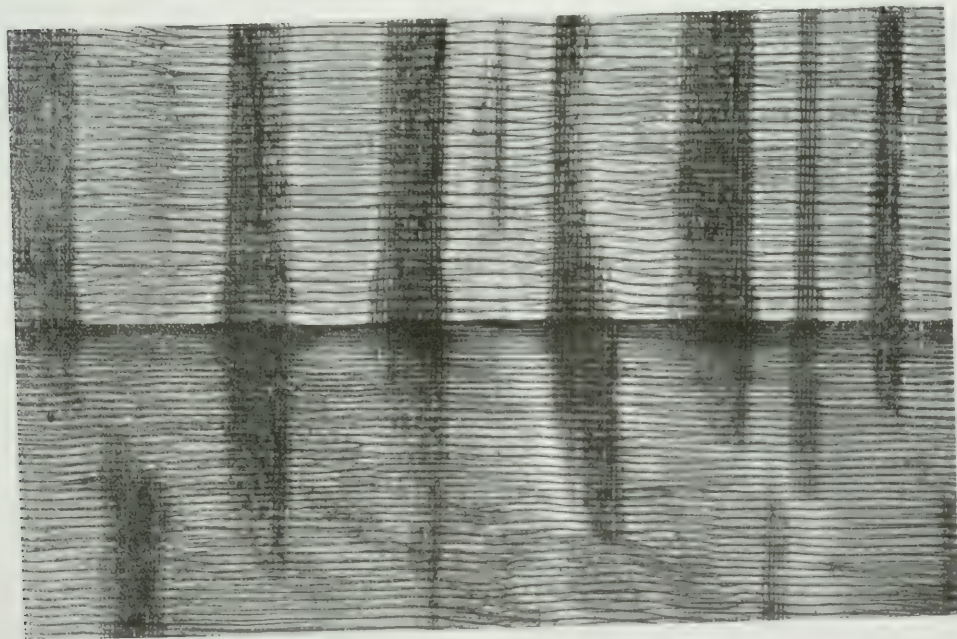
ABIES BALSAMEA Balsam Fir Tangential x 210



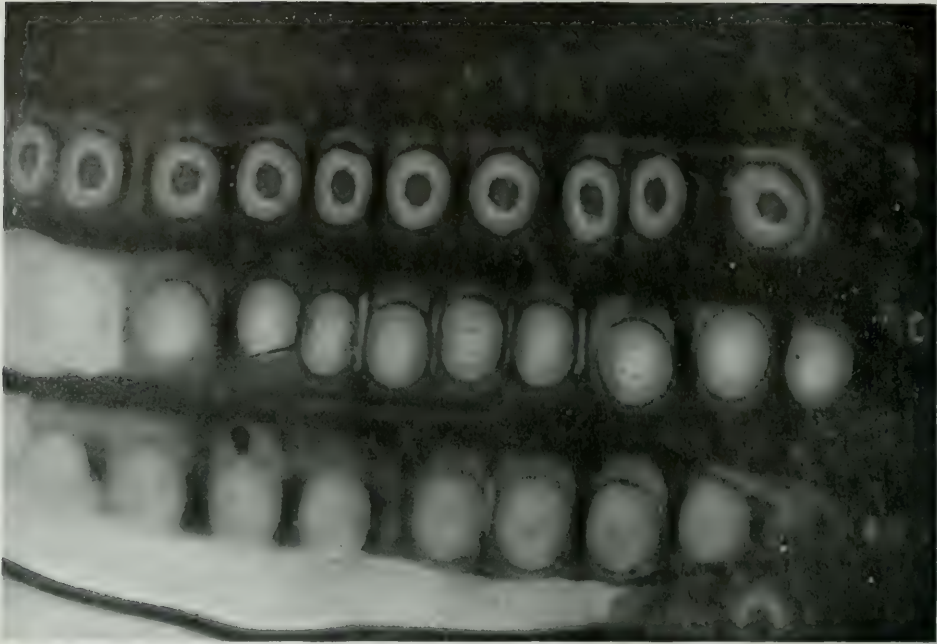
ABIES BALSAMEA Balsam Fir Tangential x 650



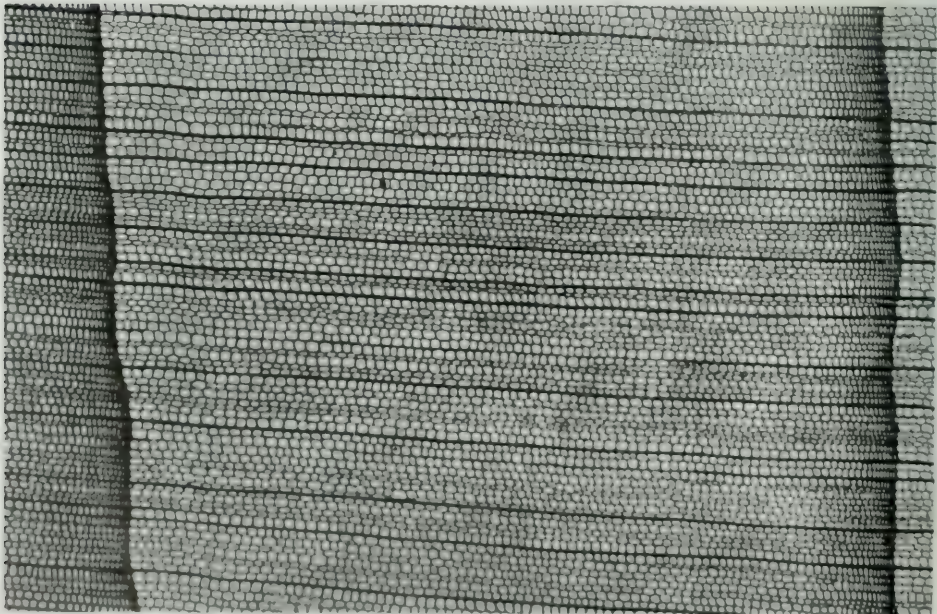
ABIES BALSAMEA Balsam Fir Tangential x 50



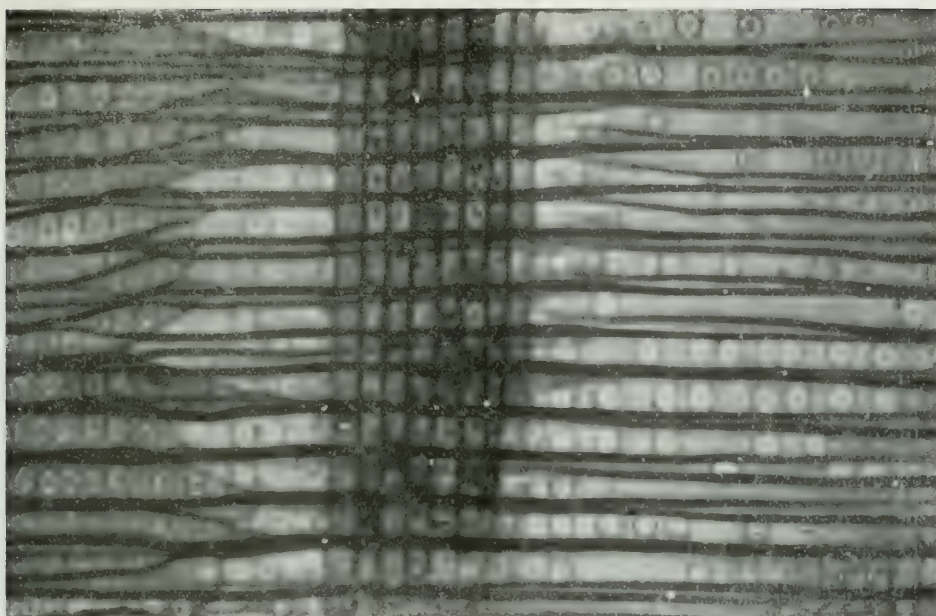
ABIES BALSAMEA Balsam Fir Radial x 50



ABIES BALSAMEA Balsam Fir. Border Pits x 650



ABIES BALSAMEA Balsam Fir. Transverse x 50



ABIES BALSAMICA Balsam Fir Radiata 250

AMERICAN WRITING PAPER CO.

Holyoke, Mass., February 10, 1914.

The American Writing Paper Company has issued its report for the year ended December 31, 1913. The income account compares as follows:

	1913.	1912.	1911.
Net earnings	\$ 943,910	\$1,489,762	\$1,400,096
Other inc.	105,943	111,887	125,435
Total inc.	1,049,853	1,601,649	1,525,531
Bond interest	850,000	850,000	850,000
Other ded.	329,043	306,392	312,208
Deficit	129,190	*445,257	*363,323
Sink. fund	100,000	100,000	100,000
Deficit	229,190	345,257	263,323
Dividends	124,805	249,610	249,564
Deficit	353,995	*95,647	*13,579

The balance sheet of the American Writing as at December 31, 1913, shows assets as follows: Investment and real estate, \$15,687,906; goodwill, trademarks, etc., \$18,010,150; current assets, \$6,114,356; sinking fund \$1,908,000; total \$42,720,412.

Liabilities: Preferred stock, \$12,500,000; common stock, \$9,500,000; bonds, \$17,000,000; accounts payable, \$51,380; reserve fund \$3,145,411; profit and loss surplus \$523,621; total \$42,720,412.

At the meeting of the directors last Wednesday, W. X. Caldwell resigned as president, which office he held for ten years. Mr. Caldwell's retirement is due to ill-health. No successor was elected.

The directors amended the by-laws creating the office of chairman of the board and elected Mr. Caldwell to that office.

The other officers elected were: Kingsley L. Martin, first vice-president; George B. Noble, second vice-president; Edwin Gould, third vice-president; Alfred

Leeds, general manager; Edward H. Hall, treasurer; W. C. Wharfield, assistant treasurer, and Edwin S. Smith, secretary.

With the retirement of Mr. Caldwell, Kingsley L. Martin, formerly of Brooklyn and formerly Bridge Commissioner of Greater New York, and commander of the Second Naval Militia of Brooklyn, has become the acting head of the company. Mr. Martin went to the company a few months ago as vice-president and general manager, with a view to rehabilitating it. It has been learned that under his direction the selling organization of the company is being steadily strengthened through the acquisition of good men and that the mills and machinery are being gone over to improve their efficiency and to insure the highest quality of output at the lowest cost of production.

COLORING FOR EASTER EGGS.

Lee, Mass., February 10, 1914.

The Eaton-Dikeman Company of this place, has brought experiments to a successful conclusion, and they have manufactured eight tons of paper to be used in the coloring of Easter eggs.

The paper has been sold and shipped to parties in Jersey City, N.J., and Bloomsburgh, Pa. The paper is cut into squares 3 x 3 inches in size and eight different shades may be made. The quantity of paper will be sufficient to color over a million eggs.

Heretofore the Easter eggs have been colored by the use of tablets that are manufactured in Germany. In Jersey City and Bloomsburgh the paper will be cut in strips and put in envelopes for easier distribution to all parts of the world. A strip of the paper is dissolved in warm water and then the egg is placed in the water and the coloring trick is accomplished.

the middle position between the cellulose, and the perennial woods, and it may be said to be, as a rule, the case in connection with the distinguishing reactions of these bodies. Jute, if treated by the cuprammonium reagent is almost wholly dissolved, but it has little effect on the ligno-cellulose of the woods, and strong solutions of the caustic alkalis mercerise jute, and fibrous ligno-celluloses, of similar components, but not upon the woods.

It has been estimated that Germany, Norway, Sweden, Finland, America, and Canada produce per annum, between them, 4,628,000 tons (air dry) of mechanical and chemical wood pulp. The wood comes into consuming districts in logs measuring 8 feet x 4 feet x 4 feet. The Aspen, Balsam, Basswood, Fir, Pine, Spruce, and Tamarac trees, all yield commercial wood pulp.

The manufacture from wood pulp of paper owes its origin to J. C. Schaffer, a priest, who made paper of good quality from several species of wood, about the year 1770, but the production of artificial silk yarns from wood pulp is comparatively a recent invention, but very little was heard of this prior to year 1890, although, no doubt, experiments in the direction were being carried out by at least a few inventors. Samples were exhibited in England for the first time, in bulk, about 1893. The Chardonnet process had not been working very long at Besancon before the manufacturing of artificial silk threads from wood pulp commenced, and the industry has since grown very rapidly, cotton is, however, our type of chemically balanced cellulose, and is of a higher order of stability than the wood celluloses. Wood cellulose is always a residue of chemical processes.

The cellulose in particular in the form of artificial silk is treated with formaldehyde in aqueous solution containing, in addition, auxiliary agents, which determine combination, and as a result of the combination there is, experts state, some constitutional change in the cellulose itself, accompanying the fixation of the H_2CO groups, which gives proof of a power of internal structural modification that opens up an interesting field for study.

Two means are employed for the bleaching of wood pulp, the most common being the use of ordinary bleaching powder, the second the treatment of the pulp by solutions of soda, or magnesia, prepared by electrolysis of the chlorides.

The celluloses in the form of ultimate fibres are the unit elements of structure of the yarns, and threads, which are the basis of textile fabrics. The processes by which they are mechanically prepared, and then spun into thread are determined by their dimensions. Artificial silk may be said to be structureless, as it is prepared from structureless solutions of cellulose derivatives, it in this way is like true silk, which is produced in solution in the glands of the silkworm, and turned out into the atmosphere, the worm doing the mechanical process of drawing and laying the threads in the specialised form of cocoon. Cellulose allows of very hard treatment in going through a cycle of operations, and reverting to an amorphous substance which retains much of the structural properties of the original.

In addition to the manufacture of artificial silk from wood pulp by the Glanzstoff and Viscose processes a very important new textile has lately been produced from the product, namely "Silvalin" yarn, samples of which spun into various counts applicable for many different purposes, dyed and plain, were exhibited at the City Hall Exhibition, held in Manchester in Oc-

tober last year, in connection with the Textile Industries, together with numerous examples of the yarns woven into piece-goods, curtains, mats, carpets, etc., etc., and were very favourably commented upon. R. Kron has devised a method for the spinning of this Silvalin yarn in which the production of the original pulp strips is intensified at its full width, the web being subdivided into narrow strips by an arrangement for projecting jets of water upon the web, at such distances that the web is divided into 100-500 strips per metre. The separation of the strips is, however, not thus completed, they are wound upon a roll of the full width, and are afterwards separated, and detached as discs. It is based upon a patent covering process for twisting, or spinning, the cellulose (pulp) directly from pulp rolls, on addition patents, (1) for winding up the wet web at breadth of the machine to be afterwards divided in pulp discs of suitable narrow width. (2) Improvements in the manufacture of pulp rolls in a moist but coherent state, and patents for process, and apparatus, for winding up moist strips of paper pulp, etc. Process and apparatus for subdividing a web of pulp (as on the wet sud of a paper machine), into strips. Apparatus for direct delivery of moist pulp strips, and spinning machine for preparation of detachable cops.

The Kron process proceeds as under. The formation of the web on the Fourdrinier wire, its subdivision into strips by the impact of jets of water for the number of strips required to be formed. The pulp strips are submitted to the action of press rolls for the gradual removal of water and progressive solidification of the fibrous mass, it is then, further, dried by heat on a steam heated cylinder, and then wound up in what is called a magazine roll, which so holds a series of discs in close contact. These are detached as needed for the further process of twisting, and are set out for winding off in a horizontal, or inclined, position below the spindles.

The winding-off and twisting, calls for the passage through the machine which is the subject matter of the fourth patent named, the apparatus from which the strips are delivered continuously to spindles. These have a speed of 3,000 to 8,000 revolutions per minute with the sliver travelling at 8 to 16 metres per minute, according to the size of the yarn, and the degree of twist needed.

It has been estimated that this description of yarns made from pure wood-cellulose have a mean breaking length of 5 to 7 km., with an extensibility of 6 to 7 per cent.

Warps of wood pulp yarn need no previous dressing or sizing. The goods when finished have about one half the strength of jute materials of the same make, and weight. They lose their tensile quality completely when wet, but regain their strength in drying. This is a serious drawback on these materials, but so long as they are kept dry they are all right. Wall coverings, stair matting, braids, webbing, furniture coverings, upholsteries, hatbands, canvas for tennis shoes, overalls for workmen and tweeds made of wool and silvalin, and worsted and silvalin suitings were exhibited at the recent Manchester Exhibition in addition to the goods already named. Some of these only contained from 25 to 100 per cent of silvalin, however. One exhibit which looked very well was a handsome hanging, or cover, for a drawing room mantle board. String and cordage made from the material was also shown. The natural colour of the yarn is a light brown, and in this such colours as crimson, blue, green, etc., show up in very good relief. The material, in fact,

takes the dye remarkably well, and the stall which the Silvalin Yarn Spinning Co., of Manchester, had at the exhibition attracted an unusual amount of attention from visitors.

The yarns and cloths can be, of course, bleached white. Two systems are employed for the bleaching of wood pulp, the most common being the use of ordinary bleaching powder, the second being the treatment of the pulp with solutions of hypochlorite of soda, or magnesia, prepared by electrolysis of the chlorides as already stated.

The bleaching of wood pulp by means of a clear solution of ordinary chloride of lime is simple, and may be said to be fundamentally a process of oxidation. The method consists in immersion of the pulp in a given quantity of diluted bleach liquor of definite strength but many modifications are available, and they need to be closely studied in order to produce the best results economically. If wood pulp be well washed in warm water before bleaching this gives it a greatly improved colour. Large quantities of paper are, of course, manufactured from wood pulp, and one of the earliest, and largest works formed in England to carry on this industry is that of the Kellner Partington Paper Pulp Co., Ltd., of Barrow-in-Furness.

With respect to artificial silk manufactured from wood pulp, its breaking length in kilometres averages 12.0, and its elasticity is 2.0.

As a chemical individual, wood cellulose differs but little from cotton cellulose, and where only chemical relationships are involved there is an obvious probability of the former being able to substitute cotton as a basis of manufacture. For such substitution there is always the inducement of relatively low market price.

Artificial silk yarn, or as it is often called Lustra cellulose, is used largely for ladies belts, table covers are also made from it. Belgian manufacturers utilise it largely also, for figured effects, especially in linings, it is also employed extensively for making tapestries, and furniture covers. It is further used largely for wide and narrow braiding. Ether and alcohol are two agents which are greatly used in the production of lustra-cellulose thread from wood pulp.

Herr Emil, Clavier, a Saxon, has also invented a process for making thread, somewhat like silvalin yarn, from wood pulp. This is based upon a finished, but unsized, paper, as a raw material. This is cut into the strips of a few mm's width, each strip being separately wound in a bobbin, which is then transferred to a spinning or twisting frame. In the condition of twist it is submitted to a rolling process to consolidate the thread, and this treatment is repeated at the manufacturing the thread in a second machine, the speed of which is regulated to give a certain drawing effect.

The spindle for the spinning, or twisting, of the paper strips has a spool, or reel, carrying the paper strip of 2-3 mm width, and this is carried on a hollow brass axis, which is held in position on the spindle by means of springs. The three rotate in the same direction in which the paper strip was wound on the spool, the slip is thus folded, and drawn off through rollers under a suitable tension. The yarns produced under this system are known as "Nidolin," and they compete successfully against lustré yarns.

Just as various means are employed in textile manufacturing for giving a high degree of twist to textile yarns in their final form the same principles, and form of machinery, are pressed into the service of the paper

pulp spinner. The twisting of the yarn is done on ring spindle machine frames, which have 60 to 70 spindles on the side. In spinning wet yarns, the delivery of the spun yarn varied, which permits of it being wound directly into cops, or on to tubes placed over the spindles. With respect to the effectiveness of this method two restrictions apply, one is the method of making the pulp strips in a "cylinder" machine; the alternate process and machine founded on the flat running Fourdrinier wire with its much higher productive efficiency is taken by Kron process as the basis of their system. The second restriction, with regard to output, and accordingly economic production, is in the speed of the machine, and process of rounding and consolidating the strips. A machine of 80 spindles having a running speed of 12-15 m per minute, will produce from 1,382,400 m. to 1,728,000 m. per diem, off which 30 per cent. must be knocked for breaks and stoppages. A heating engine of the Hollander type with 160 to 200kg. dry pulp capacity, dealing with four charges in the 24 hours, will feed two of these special machines.

Viscose, which in thread or yarn is an artificial silk, is formed by a combination of cellulose with acid groups, the compound is soluble only in alkaline liquids, it decomposes by its own force with reformation of cellulose. The first step in the viscose process of artificial silk manufacture is the conversion of the cellulose by treatment with caustic soda solution at mercerising strength. The wood pulp may be treated with the alkaline lye by reducing the wood pulp in a kollergang with water sufficient to cause the disintegration of the sheets, and then adding the calculated quantity of caustic soda dissolved in a quantity of water sufficient to produce a mixture of cellulose 25 to 30 per cent., caustic soda 12.5 to 15 per cent., and water 62.5 to 55 per cent., or the sheets may be steeped in excess of a lye of 17.5 per cent caustic soda, lift, drain from the excess, press to a calculated weight, and then grind in a mixer to secure even admixture of the mercerising reagent with the cellulose.

There are at least a few classes of knit goods, or what may be termed knit goods, in connection with which wood pulp artificial silk and such yarns as are produced by the Silvalin Company, and the Clavier and other processes, are of interest, for one both descriptions would answer well for knit fringes on curtains, overmantles, and similar goods, the yarn produced by the last named two systems has not the lustre of the first named or of artificial silk manufactured by the gun cotton process, indeed, no lustre whatever was to be seen in the samples exhibited at the late Textile Machinery Accessories Exhibition held in Manchester to which reference has already been made, nevertheless, the goods looked very nice indeed, particularly those which had laid designs printed upon them. On the light brown background of the Silvalin cloth, they were, in fact, very artistic. Having this colour they would not need many washings, owing to soiling rapidly, if made into fringe knit materials, golf bags, holdalls, rucksacks, etc., and other lines might be struck of this class in connection with which they will prove of value.

With respect to the gun cotton, and artificial silks, it is doubtful whether they will ever give complete satisfaction when manufactured into piece goods for general wear such as ladies dress goods, so, though for braiding, ladies belts, neckties, straw hat bands, and so on, the yarns answer very well, and a very good demand exists for them for these, and the other purposes which have been already named.

Celulose may be said to be the non-nitrogenous skeleton of vegetable tissues.

The rise of the various wood pulp manufacturing industries has led to great forest devastations, and in some cases the governing authorities have had to pass laws restricting within certain bounds the cutting down of trees to meet the demand for raw supplies.

The utility of wood pulp yarn, and the methods employed in its manufacture were discussed at a meeting of the London Section of the Society of Dyers and Colourists, held lately, and the fact that the yarns lose their tensile strength entirely in wetting, and that they have only half the strength of jute fabrics of the same weight, and make, was named.

After soaking in cold water, the "Kron" yarn seems to lose 75 per cent of its strength, but still has a breaking strain of 170 grms. The yarns have an elasticity of 6 to 7 per cent, and a breaking strain of 5 to 7 kilos. It is difficult, however, without trial to estimate what would be the behaviour of such yarns under practical wearing conditions, especially when they are woven with other fibres, and although the former statement may be true in itself, yet in the actual use of such yarns, in practice, more satisfactory results have been obtained than might be expected.

For example, a sample of table cloth material which has been in use in Germany for three years, with constant washing, is still quite good. It contains some 60 per cent of this yarn.

It is only by actual trial that the working properties of such materials can be tested, and these seem to be satisfactory within certain limits, which may be regarded as giving the yarns a place in the textile industry.

The yarns are manufactured in Germany in one factory to an amount of 6 to 7 tons per week. Factories are being erected that will devote themselves particularly to its use in the manufacture of sacks, and such like materials. At the same time these yarns have an actual decorative value, many really beautiful products being obtainable.

Dyeing seems to present no difficulties, and may even be conducted in the yarn state.

These products will have special interest to the dyer, and the cleaner, who may once more have their working conditions rendered more difficult. The many uses that this yarn has been put to include the manufacture of wall and paper coverings, hessians, tarpaulings, braids, some of which have been knit goods, hat bands, to which the same remark applies, tweeds, suitings, and overalls, and many other cloths of varying make, in addition to the use of the yarns themselves in the shape of twine and string.

The value of the paper pulp in yarn form has been expressed by O. N. Witt in terms of the comparative value of one c.m. of wood, which has been put at 3s. Transferred into paper it has a value of £1 15s., into paper yarn £2 5s., and into artificial silk £7 10s. These figures are significant.

Paper yarn is now being spun, and cloth woven from it at Dundee, in Scotland, in a mill which has been specially fitted for the purpose, and the proprietors of the mill, who have been putting forward great efforts in connection with the business for some time past, are meeting with considerable success in the venture. The firm in question is Messrs. Ferguson & Co., of Bed-ville Works, Lochee Road, Dundee, Scotland.

SIZING TROUBLES.

According to an article in the *Papier Zeitung*, it occasionally happens that rosin sized papers may show perfectly satisfactory sizing immediately after their manufacture, but may show a gradual deterioration in sizing during storage for a few weeks or months. The most usual cause of this trouble lies in the manner of drying the paper, whereby moister layers of fibres in the interior of the sheet are enclosed by thin hard sized layers on the outside. To avoid this condition of things the drying must be so regulated that the paper reaches a high degree of heat while it still contains a large proportion of moisture. The particles of rosin precipitated on the fibre can only fuse together to form a waterproof protective coating when the paper is heated up quickly after passing the first drying cylinder, which, however, should only be moderately heated. The object of the second cylinder and those immediately following should be to heat the paper up quickly without driving off very much of the moisture; these cylinders, therefore, should be very hot. This moist heating has the effect of softening the particles of rosin and causing them to unite, whereas if the paper is allowed to become too dry before any great heat is applied the rosin particles, at any rate in the interior layers, will not be united, but remain in a powdery form, however great the heat may be on the later cylinders of the machine. Papers prepared from "wet beaten" stock are very liable to this kind of fault.

Papers which have to be calendered on separate machines are damped, reeled up and allowed to condition before calendering. This damping is very beneficial for papers which have been dried in a proper manner, but in the case of those papers which, through improper drying, are poorly sized in the interior of the sheet, the damping brings out the fault. The soft sized interior portions absorb an undue amount of moisture and in the glazing calenders these extra moist constituents are squeezed up to the surface so that the paper becomes soft sized. Paper which is well heated up on the earlier cylinders of the machine has the rosin thoroughly united throughout its mass, and it can be dried with a gradually moderated temperature in the later drying cylinders, with the result that it may be brought into condition with only a slight damping so that the sizing is not affected by the calendering.

Another important point in obtaining, well sized papers, in the writer's opinion, is the order in which the sizing agents are added to the heated. It is important to add the size before the alum, in order that not merely the exterior of the fibres, but also the interior, may become impregnated with particles of rosin. If the alum be added first this gets inside the fibres and precipitates the subsequently added rosin before the latter can enter. The diluted size should be added at least a quarter of an hour before the alum; it is recommended that the mineral loading be added after sizing, about a quarter of an hour before the beater is discharged.

The Frank H. Harris Lumber Co., Limited, Toronto, has been granted a provincial charter with a capital stock of \$40,000 to take over the business now carried on by the Frank H. Harris Lumber Company. The concern is given wide powers, including the right to carry on saw mills and timber growing and to manufacture and deal in timber and woods of all kinds, as well as to buy timber estates. The incorporators are: Wm. H. Harris, Frank H. Harris, Joseph Walmsley, Harry Crighton, and others, all of Toronto.

The Hand-Made Paper Industry in England

(By Our London Representative.)

Eleventh century writers tell us that the peoples notable for producing papers by their hands were always great naval nations, and they cited as an illustration, England's progress in the industry. The first methods of making paper, however, may be placed to the credit of the Chinese of early days, but for energy, and for bringing the hand-made industry to a high state of efficiency and perfection, the English people—though they are in possession of the greatest and largest naval force in the world—have surpassed all rivals. To-day the centre of the hand-made trade is in the county of Kent—the land of flowers and hops—and it is to this part of England that we look for high grade papers to supply all parts of the world.

Machine-made paper, of course, has very materially limited the supply of hand-made on the market, this being largely attributable to the forest resources of Canada and other pulp producing countries, and to scientific research work. But the largest of London printers admit to-day that for letter-press work, or any other work, they prefer the hand-made material best of all, but its high price militates against its general use.

Another keen competitor the hand-made paper mill has is the machine mould-made paper mill, and to place samples from these two mills side by side, it would take an experienced expert who understood the production of both mill papers to say what was the difference between them, and which was mould-made and which was hand-made. I have seen experts make mistakes over the papers, and I have seen people take up mould-made paper in their hands and express their gratification on the fact that a British mill could turn out such a high-class "hand-made" product. It is only natural, therefore, that in the estimation of large printers who, do letter-press work, they recommend the use of mould-made as an excellent substitute to hand-made paper. But let me say that the production of mould-made paper with the "hand-made" appearance is as secret as the grave in which our forefathers lie, and the hand-made paper producers would forfeit all they have in their possessions to ascertain the internal workings of their rivals. It would be a great event if that discovery was made, but the mould-made producers must protect their ingenious inventions, not only for their own purposes, but as keen competitors with the hand-made mills.

Notwithstanding, all the rivalry that the hand-made paper industry has to contend with, the mills are in a flourishing condition, and they are turning over good profits. The mill owners do not complain so much of the competition experienced from machine made paper as they do of the alleged imitations of hand-made paper, which is put on the market. These imitations are a "sore thorn in their sides," because there is a great demand in England for the good hand-made product, and amongst the supporters of hand-made are the principal government officers, which, of course, include the Stationery Office. For the protection of their trade there is the Hand-Made Papermark, a name, a body of which very little is known, so secret are its meetings and meeting places—and one of its objects is to put down fraudulent imitations of

the hand-made article which the Merchandise Marks Act (an Act usually enforced by the Trade Board) did not seem to stop. Therefore, employers and all their employees are constantly on the look-out for people selling machine paper in England as hand-made, but so far the number of prosecutions has been extremely small. Last year was a very good period for the mills in the hand-made industry, but the number of vats in the trade was at a low ebb. In 1913 the number was 68, the lowest recorded since 1894; but it seems singular to record that the quantity of paper turned out, or the tonnage, was far greater last year than ten years ago.

As a rule, in the month of January in each year, there is gathering of the "clans" engaged in the hand-made paper industry in Kent. The employers and their workers all meet and they discuss the position of affairs, some of the speeches being most interesting. At this year's gathering, Mr. C. H. Balston (Springfield Mill, Maidstone) remarked that their business might be old-fashioned and conducted on old-fashioned lines, but they did like to think in these days of so much industrial unrest that amongst the hand-made papermakers' that old time feeling of friendship still prevailed. With reference to the past year, he had had an opportunity of looking into the figures, and found they had sent away more paper than they did in 1912. That was encouraging, because, it showed that the hand-made paper trade was not going to die yet. It was for them to see that the users of their paper were thoroughly satisfied with it, and to this end they must not relax their efforts for a single moment, but rather redouble them. Their policy had always been to keep up the manufacture as high as possible, and the stability of their trade showed that had been a good policy. But they must not rest there. Competition grew keener every day, and they must look to the organization and economy of the mill, to the efficiency of the machinery and the workpeople, and they must see there was no waste whatever.

The name of Balston has been associated with the hand-made industry for over 100 years, as the mills have been handed down from father to son. Mr. F. Crispin, another speaker, regretted that the hand-made paper industry had not been as prosperous as they all desired, but they were glad that a good trade generally with a genuine article had been maintained. The action taken by the Employers' Association of inviting co-operation of the members of the workmen's society to assist them by bringing to their notice cases of machine paper being sold as hand-made, would have a very decided effect upon the trade. He hoped it would result in increased trade, and he was sure every member of the workmen's society would cordially respect the invitation. If the principle underlying the invitation was more generally acted upon, it would prove advantageous to all engaged in the hand-made paper trade. Mr. E. C. Riddle (rag department of Springfield Mill, Maidstone), pointed out that employers had been compelled to seek new sources for trade, and one of these was the industry of cards, which were used for a variety of purposes. Everyone knew the reputation Springfield Mill had for its paper. The reputation was world wide and the class of paper turned out left the foreigners far behind, as the amount of paper sent abroad was really amazing. In one week Springfield Mill was distributing paper to all corners of the globe—Canada, Japan, Russia, Germany, Australia, America, etc. Very few mills in the world could produce such a record, and it was

almost done in one day. Personally, he believed the hand-made paper industry had a big future before it and there was plenty of room for hand-made paper as well as other productions. He hoped those who were making imitation papers would have the courage to call them what they were.

Mr. W. Burgess (chief foreman at Springfield Mill) said it was true that vats had been shut down at some mills, but others had been opened elsewhere. Generally, it was the small mills that had disappeared, and the large mills that had increased, and it was just possible that those which had closed would not have done so had they kept to making the very best of paper. The main thing for a mill to rely on was the turning out of the very best article. If they did that, the hand-made paper trade had a capital future before it.

Forestry Convention

(Special to Pulp and Paper Magazine.)

Ottawa, Feb. 10.—That a National Forestry Congress, the first since 1906, will be called in Canada early next year was one of the most important announcements made at the annual meeting of the Canadian Forestry Association, held here last week, and largely attended by lumbermen, pulp and paper manufacturers and others, connected with the timber industry, who are its members.

After presenting reports and electing officers, the Association waited on Premier Borden and some of his Ministers with certain recommendations concerning forestry matters. The Prime Minister took this opportunity of suggesting that a National Forestry Congress be held, and it was decided to ask him to call one in January or February of 1915, accordingly. The last Congress of this kind was held in Ottawa in 1906. The present one is more or less an outcome of a discussion in Parliament a week ago, when both the Leader of the Opposition and the Prime Minister, during a discussion over the estimates for the Commission of Conservation, approved of the idea of still further encouraging forestry work by means of a Congress.

The annual meeting of the association took place on Wednesday last. Features were the directors' report of work during the year, the election of officers and the framing of recommendations. The directors' report, after dealing with the last Forestry Convention, went on to state: "Looking over the general field, it is seen that the work of forest protection and reforestation has made steady, if not rapid, progress in 1913. The amount appropriated by the Dominion Government for the work of the Dominion Forestry branch was \$541,000, and the work was carried out with an increased staff, particularly in the field, the number of men in the outside service being 300, of whom 25 were technically trained." The report went on to state that the fire loss during the year was the smallest in the history of the Department, the amount burned over being one-fiftieth of one per cent. of the reserve area.

The area in the reserves in the different provinces is now as follows: Manitoba, 4,108 square miles; Saskatchewan, 1,803 square miles; Alberta, 26,271 square miles; British Columbia, 3,782 square miles. The report detailed the amounts spent and the features of the work done in the different provinces in the line of forest protection, and showed that in Quebec \$118,000 had been expended by the Government and \$150,000 by the limit holders themselves, while the Province had commenced the planting up of sand lands with trees for pulpwood, and was extending its policy of

creating township forest reserves. The Ontario Government's expenditure was \$234,000, while the limit holders had added \$91,000. British Columbia spent for fire protection the sum of \$375,000; New Brunswick, \$35,000, and Nova Scotia \$8,000. The report went on to state that lumber and pulp companies were cutting their timber with less waste than ever before; a number of them were having their holdings surveyed and estimated by forest engineers, and some were beginning to experiment in thinning and replanting.

The following resolutions, besides a number of less important ones commending the Government for its forestry work, the establishment of a Forest Products laboratory, etc., were presented to the Government:

That before any lands bearing timber or lands contiguous to timber areas are opened for settlement an examination of such lands should be made to determine whether they are best suited to the growth of timber or whether their opening would endanger the timber.

That this Convention would urge upon the Dominion Government the necessity of the afforestation of the sand lands throughout the prairies and the setting apart of such lands for the purpose.

That this Convention records its approval of the work of the Tree Planting division of the Dominion Forestry branch in providing practical demonstrations to settlers of the possibility of forest growth on the prairies.

That this Convention recommends that experiments be carried out by the Dominion and Provincial Governments to obtain data regarding the best methods of disposal of debris resulting from lumbering operations.

That this Association again expresses the opinion that it is important that all appointments in the forest service of the Dominion and Provincial Governments should be based on capability and experience.

Mr. William Power, M.P., of Quebec, was elected president of the Association; F. C. Whitman, of Annapolis Royal, N.S., as vice-president; while Hon. George Peckay, of Ottawa, Hon. Dr. Roche, Minister of Interior; A. C. Flumerfelt, of Vancouver; Hon. Nathaniel Curry, of Montreal; Mgr. Roy, of Quebec; H. R. MacMillan, chief forester of British Columbia; and Clyde Leavitt, chief forester of the Railway Commission, were added to the Board of Directors. It was decided to hold the next annual convention in Halifax.

PRICE BROS. TO OFFER SUBSIDIARY'S BONDS.

Price Bros. & Co. are shortly to offer \$600,000 bonds of the Shipshaw Water Power Co., a subsidiary with a water development at Murdoch Falls, about two miles from Kenogami.

The present installation develops 6,600 horse power, but provision is made in the power station to bring the capacity of the plant up to 10,000 h.p. at a cost of \$40,000 for the additional unit. The company has entered into an agreement with Price Bros. by which it sells 5,000 h.p. at \$15 per h.p.

Gross earnings of the power company are estimated at \$75,000 for 1914, net at \$67,000, and surplus after bond interest at \$37,000. The installation of the additional power unit, it is stated, will enable Price Bros. to increase considerably the capacity of the Kenogami and Jonquiere plants.

The development of this power originally started during the construction of the Kenogami Mills. It has been separated from the original company and called the Shipshaw Water Power Co. This method of issuing additional bonds was adopted, instead of issuing straight Price Bros. bonds.

THE PRINT PAPER FIELD.

A Summary of the Year's Activities as Viewed by "The Fourth Estate"—Interesting Review of the Situation by Arthur C. Hastings.

In the annual review number of "The Fourth Estate" the print paper field was referred to at considerable

length. The condition to-day is overproduction and increased imports, and the installation of new machinery and new mills have made it impossible for the average mill to secure any return on capital invested.

When the enormous imports of printing paper from Canada alone are taken into consideration, which increased 90,000 tons in nine months of 1913, as compared with the same period of 1912, or at the rate of 120,000 tons a year, it is apparent that it is impossible for the American mills to operate their plants to their capacity.

The natural tendency has, of course, been to lower prices somewhat, and the only plausible reason why they have not decreased more is because they are now, in most mills in the United States and in Canada, below the cost to manufacture, therefore it is fair to suppose that prices cannot go lower, and they must go higher. The constant increasing cost of production in 1913 over 1912, due to a rise in the cost of the chief ingredients in the manufacture of paper, as well as the constantly increasing cost of labor, is apparent.



ANGUS McLEAN.

General Manager, Bathurst Lumber Co.
Recently Elected Second Vice-President of Canadian Lumbermen's Association.

length. A feature of the article was the following contribution from Arthur C. Hastings, president of the American Paper and Pulp Association:



E. R. COLBERT.

President Gunned Papers Ltd., recently organized at Brampton, Ont.



JOHN R. BOOTH.

Recently elected Hon. Pres. Canadian Lumbermen's Association.

"I believe the only thing the manufacturers of this class of paper may look upon with satisfaction as to the last year's business, is the fact that they are aware that they are not making money, and they are aware that they must either lower the manufacturing cost or increase their selling price, if they are to continue in business, therefore, the outcome for the future, in my estimation, is somewhat encouraging.

The effect of the recent tariff legislation has been as forecasted by the manufacturers. The only advantage we can see to the publishers has been the investment of money in mills in Canada, which investment

"The year 1913 in the general paper business has not been at all satisfactory. In the news print manufacture

so far has not been profitable. Temporarily this has led to overproduction, but eventually the demand must be somewhere near equal to the supply. Money will not be invested in unprofitable enterprises."

Newsprint Paper a World Commodity.

"The Fourth Estate," in its review, refers to the removal of the import duty on newsprint, which act, it points out, made this grade of paper a world commodity. In this connection it says:

A world commodity which flows unrestricted from the point of manufacture to that of consumption is controlled so far as price is concerned solely by the law of supply and demand. If the cost of distribution were based on a uniform charge per ton per mile, if the cost of raw materials and labor were the same at all points of manufacture, if the investment per ton of daily output were the same everywhere; if the quality were uniformly alike for all mills; if a daily quantity output were constant throughout the year; if the widths of all paper machines were equally suitable for all consumers; if all mills were located where they could be certain of train service each day in the year; and if all publishers were equally fair to deal with and paid their paper bills with equal promptness, then, and then only, could the whole problem be plotted and all publishers would know exactly where the economic point of supply is for each—and relatively few publishers would pay the same price.

The facts of the present are that transportation costs do not correspond with mileage, the problem is complicated by commodity rate theories, by long and short haul theories, water competition theories, winter and summer rate theories, theories of arbitrariness conceded to long hauls to offset extra time in transit, on the theory of making non-competitive, long, round-about hauls competitive, provided the commodity can stand the extra time.

Then, too, few paper mills are so situated that they can turn out a continuously uniform quantity, on account of high and low water, others are locked in the arms of winter, sometimes for weeks at a time.

Location and physical conditions naturally affect the investment cost per ton of daily product.

Raw materials vary greatly in cost, depending upon mill location; the nearer the mill is to cheap wood the greater the cost of everything else.

Ability and skill in mill management vary materially in different mills.

Uniform quality throughout the year is well nigh impossible.

Then again, one publisher wants one width rolls, another wants another.

One publisher wants one finish and his neighbor wants a different one.

One publisher wants a thousand tons this month and perhaps only 500 the next. One publisher wants a natural color and this a yellow white, another a reddish white, and then a bluish white, and so on, ad infinitum.

Production and Price.

In 1911 the consumption of newsprint paper in the United States was 1,372,579 tons; in 1912 it was 1,459,003 tons; in 1913 it will probably be well in excess of 1,500,000 tons—it will probably be two months before the exact figures can be given.

The increase of 1912 over 1911 was a little in excess of 6 per cent, and the increase of 1913 over 1912 will show almost 5 per cent. "The Fourth Estate" has looked thoroughly for some sound reason on which to base the hope that the price of newsprint paper may

not advance. So far but one factor is apparent, and that is over-production, and the publisher who bases his operation upon its continuance will come to grief, for it is an economic fallacy.

Experts say that for 1913 for all kinds of paper made from wood, to supply only the United States, over 1,000,000 acres of land was denuded of its timber.

The price of newsprint paper in the period from January 1 to September fell until, in the latter month, it was \$3 below the price it was on the first of the year. From September the price gradually went upward until at the close it was but \$2 below.

EXTRACTION OF SULPHUR FROM IRON PYRITES.

W. A. Hall, British Patent 20,758.

The object of this process is to extract in one operation the sulphur from the pyrites principally as sulphur vapour instead of entirely as H_2S , as described in Patent No. 20757-12, where the pyrites is submitted to the combined action of a reducing flame and steam intended to furnish nascent hydrogen and oxygen. According to the present process, a very small amount of steam is supplied to the furnace in conjunction with the direct reducing flame, in order to prevent a loss of sulphur by formation of SO_2 and COS . In the performance of the invention a furnace is employed, heated internally by direct flame consisting of a mixture of producer gas and air, the amount of air admitted being so regulated that the flame produced, while not necessarily a highly reducing flame, is sufficiently reducing in character to combine with any free oxygen. Steam, or water which would be formed in steam, is passed in through inlets provided between the shelves, but in larger quantity between the lower shelves of the furnace, the furnace being provided with an outlet from which extends a long discharge pipe. Into this discharge pipe steam may also be passed. When the furnace has been raised to the proper degree of temperature, preferably somewhat above 700 deg. C., the pyrites is led therein in a continuous stream with the least admission of air possible. The pyrites should be agitated to the greatest possible extent while in the furnace, otherwise much less sulphur would be discharged. The products of combustion pass up through the long pipe, in which the temperatures reduced several hundred degrees, and the products of combustion pass out, supercharged with yellow sulphur vapour without any appreciable admixture of SO_2 . The discharge pipe leads the sulphur vapour, and products of combustion to a gas-washing apparatus, where the atmosphere is quickly clarified by the precipitation of the fine divided sulphur in the water of the washer, from which water the sulphur is extracted by any desired means.

HOW TO BUY DYESTUFFS.

The Cassella Color Company are distributing a brochure to the dyestuff-consuming industries, under the above title, which will no doubt be of interest to all dyers. The book does not pretend to be an exhaustive treatise on the subject which it discusses, it will, we believe, be sufficient in its way to make plain the efforts which this company has made to place both the buyer and the seller of dyestuff wares in a position of frank relationship to each other, where the qualities and characteristics of these important supplies may be fully determined and understood.

Abitibi.

Will Build 225 Ton News Mill.

A special general meeting of the Abitibi Pulp & Paper Co., Ltd., has been called for February 17th to consider plans for the reorganization of the company.

In an official statement issued it is stated that it is now proposed to extend the scope of the company and to proceed with the construction of a four-machine news plant of approximately 220 tons daily capacity, a sulphite mill of 60 tons capacity and to bring the capacity of the present ground wood mill up to 225 tons per day.

The authorized capital of the present company not being sufficient to carry out an undertaking so much larger than was first contemplated, it was found necessary either to increase the capital of the present company or to form a new company with a larger capitalization. The directors consider it preferable to incorporate a new company to take over all the assets and liabilities of the present company. It is now proposed to organize the Abitibi Power and Paper Company, Limited, with an authorized capital of \$7,000,000, divided into \$2,000,000 preferred and \$5,000,000 of common with an authorized issue of \$5,000,000 first mortgage six per cent serial gold bonds, and \$1,000,000 debenture stock. Of these amounts \$1,000,000 preferred, \$2,500,000 of bonds, \$1,000,000 of debenture stock, and \$5,000,000 of common will be immediately issued.

Holders of preferred and common shares of the present company will receive an equal proportion of shares of preferred and common in the new company.

The authorized capitalization of the new company is considerably in excess of present requirements and

mill will not in any way retard or interfere with the completion of the present pulp mill which it is expected will be in operation by the 1st of June, and, pending the construction of the paper mill, the profits originally anticipated as being derivable from the operation of the pulp mill will be available to the company.

It is expected that the newspaper plant will be finished and in operation by the 1st of April, 1915.



F. H. ANSON, President.

The present board of directors are:—F. H. Anson, president; Shirley Ogilvie, vice-president and treasurer; J. A. McAndrew, secretary and counsel; D. Lorne McGibbon, Sir Thomas Tait, Hon. Geo. Gordon, James Playfair, Victor E. Mitchell, K.C., and George E. Challes.

Location and Extent of the Company's Properties.

The pulp limits, water powers and mills of the company are within the territory surrounding Upper and Lower Abitibi Lakes and along the course of Abitibi River and its tributaries in the District of Temiskaming in the Province of Ontario. This district lying south of the forty-ninth parallel of latitude, which constitutes the southern boundary of the Province of Manitoba, forms part of the fertile clay belt of Northern Ontario, and is at present served by two lines of railway: the National Transcontinental and the Temiskaming and Northern Ontario. The limits are traversed east and west by the line of the National Transcontinental Railway a distance of fifty four miles from a point sixteen miles east of the town of Cochrane to the interprovincial boundary between Ontario and Quebec. The line of the Temiskaming and Northern Ontario Railway, running north and south, is within a few miles of the western boundary of the limits. A branch line of this latter railway of about six miles in length, will be completed during the summer of 1913 from Iroquois Falls Junction to the location of the mills and townsite of the company at Iroquois Falls in the township of Teffy. Other lines of railway are projected to which the company's properties will be tributary. As a location for pulp and paper mills, Iroquois Falls is ideal.



SHIRLEY OGILVIE, Vice-President and Treasurer.

is sufficient to provide the additional capital necessary to double the present proposed capacity, and when completed the plant will have a capacity of from 400 to 500 tons of newspaper a day.

The arrangement under which it is now proposed to proceed with the construction of the 225-ton paper

The area embraced within the pulp limits is 1,560 square miles, or about 1,000,000 acres. The distance by water from Lake Abitibi to Iroquois Falls is approximately forty miles, and in this distance on the course of Abitibi River there are three excellent water powers, Couchiching, Twin and Iroquois Falls, capable of developing a total of over 50,000 horse power. At Iroquois Falls, five hundred acres of land have been reserved for mill site and water power development. Many military veteran land grants in the neighborhood have been purchased and others are being secured. These will be prepared for settlement, the value of the wood exceeding the whole cost.

Pulp Wood Supply.

The Abitibi pulp limit is held by the company under an Ontario Government concession, with terms and conditions similar to those granted to other pulp and paper companies in the province.

There are upon the limit millions of cords of pulp wood, principally spruce of the best quality for pulp and paper manufacture. The entire territory is well watered and can be most economically logged.

The close proximity of the standing timber to the mills, good driving streams, and the extremely short drive (less than two weeks) required for delivery of the timber from any part of the limit to the mills, and the ease and cheapness with which supplies can be taken into the lumbering camps, enable the company to deliver its wood at the mills at a very low cost, lower, in fact, than any other pulp company in Canada. The important element of labor in lumbering operations will be provided for, as the opportunity for winter employment for themselves and their horses will attract and be a boon to settlers, many of whom are taking up land in the fertile Northern Clay Belt. Agriculture, dairy and other products will be obtainable from the settlers. In addition to the practically inexhaustible supply upon the company's limit, the pulp wood cut by settlers in clearing their lands is available to the company.

The Black River district, directly tributary to the mills at Iroquois Falls and embracing a well-timbered area of about three thousand square miles, is open for settlement. Pulp wood cut by settlers in this district can be cheaply floated to the company's mills. Sufficient settlers' wood can be obtained to operate the company's mills at their full capacity for an extended period. The importance of this source of supply of raw material is increased by the fact that pulp and paper manufactured therefrom is admitted into the United States free of duty.

Water Power.

The possibility is being investigated of utilizing the waterpower on the Quinze River, near the head of Lake Temiskaming, for the development of electric power. The river for a distance of two or three miles, including falls and rapids, is owned by Mr. J. O'Brien, who has secured the services on Messrs. Sutcliffe and Neelands, civil engineers, to obtain information. Mr. Neelands believes that the Quinze River has power enough to develop 270,000 horsepower, which he thinks would be sufficient to electrify the T. & N. O. Railway and to supply heat, power and light for all of the industries of Temiskaming, including the new one hundred-ton sulphite mill which will be erected by the Riordon Pulp and Paper Co. at Haileybury in 1915.

Commenting on the financial situation of the company, the "Journal of Commerce," the leading financial paper of Montreal, says editorially, as follows:

"The announcement that the Abitibi Pulp & Paper

Company was to be re-organized and additional capital secured did not come as a surprise to the 'street.' When the company was first organized, nearly two years ago, with a capitalization of \$1,500,000 7 per cent cumulative convertible preferred stock of which \$1,000,000 was issued and \$3,500,000 common, of which \$3,000,000 was issued. The Bond Issue consisted of \$1,500,000 6 per cent bonds, of which \$1,000,000 was issued. The company found that the period of depression and tight money seriously affected the subscriptions to their issues. In addition, the large number of new pulp and paper mills incorporated within recent years made it somewhat difficult for a new mill to break into the field. Unfortunately for them, it also happened that the price of ground wood decreased, which made their venture an unprofitable one."

"Construction work in connection with their power plant and mill has been taking place in the interval, but as funds have become low, it was necessary to secure additional capital to bring the plans to completion. At the same time, the introduction of additional capital and new blood is being used to extend the original plans. Under the re-organization plans, a 225 ton news print mill will be built, also a 60 tons sulphite mill, in addition to the ground wood mill, which is supposed to have a capacity of 225 tons per day. The company will be re-organized and known as the Abitibi Power and Paper Co., Ltd., with an authorized capital of \$7,000,000 divided into \$2,000,000 preferred and \$5,000,000 of common. In addition, there will be an authorized issue of \$5,000,000 first mortgage 6 per cent bonds and \$1,000,000 debenture stock. It is the intention to issue immediately \$1,000,000 preferred \$2,500,000 bonds, \$1,000,000 debenture stock and \$5,000,000 common."

"While the addition of a news print mill and a sulphite mill will improve the position of the company from a financial standpoint, it looks very much as if the old charge of over-capitalization can be levied with a good deal of truth against the new company. The company, as first organized, contained a good deal of water, which has not been squeezed out in the re-organization. American interests and American capital will be associated with F. H. Anson, and the directors of the old Abitibi Company."

"CATALOGS."

Some very interesting recent installations of Morris Overhead Runways are dealt with in Bulletin A 12, which we have just received from The Herbert Morris Crane & Hoist Company, Limited, Empress Works, Peter Street, Toronto.

Reproductions of some excellent photographs of these Runways bear testimony to the flexibility and handiness of the system employed.

The Morris Runway is shown in the Warehouse, Paper Mill and Foundry, and the modification of the equipment to suit varying conditions is shown in a very interesting way.

R. S. Ward, of the Beaver Board Companies, who have a plant in operation at Ottawa and are completing another plant at Thorold, has sailed for South America, where beaver board is being used with great success throughout the Colonies. Mr. Ward will not only establish new agencies, but will work with others handling the product. A former salesman for the company, he lately sold his jobbing business in Detroit to take up the new work.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

London, February 4, 1914.

Recently a good many paper mills have been changing hands in England and Scotland. Some have failed, others have been sold to men engaged in other industries, and now it is stated that an old-established mill in the vicinity of Jarrow is to be closed down. If this is the case, 200 hands will be thrown idle. It is hoped an effort will be made to save the mill and keep it running. No reason is given for the suggested closing down.

SURPLUS INVESTMENTS.

Frequently comment has been made in the "Pulp and Paper Magazine" of the benefits British paper mills derive in cases where the owners invest surplus cash in other progressive industrial concerns. An example is set us by the Ramsbottom Paper Mill Company, who run a mill not far from Bury in Lancashire. This company has not paid less than 10 per cent for the last 12 years, and now it is paying 20 per cent. for the third successive year. It is curious to note, however, that the actual trading profit in 1913 was less than half the amount received in dividends upon investments, the respective amounts being £4,223 and £9,745. The company has had the good fortune to invest £54,000 in shares of the Kellner-Partington Paper Pulp Company, which are now worth £170,437, and is holding in the Edward Partington Pulp and Paper Company a large interest which brought in £577 in 1913. These are facts which Canadian mill owners might consider and profit thereby. The company's own trading profit, however, has fallen nearly £5,300, the latter half of 1913 being a wretched time for British paper mills—and the dividend has been maintained by taking £1,373 from the balance forward. Here is the company's position for the past three years (note investments):—

	1911.	1912.	1913.
Trading profits.....	£8,543	£9,518	£4,223
From Investments.....	9,000	9,000	9,746
Brought Forward.....	7,944	9,055	12,231
Available Money.....	25,397	27,573	26,200
Preference Dividend.....	2,542	2,542	2,542
Ordinary Dividend.....	10,800	10,800	10,800
Depreciation.....	2,000	2,000	2,000
Reserve Fund.....	1,000	.....	.....
Carried Forward.....	9,055	12,231	10,858

F. MOSELEY.

Mr. F. Moseley, the president of Charles Marsden & Sons, Ltd., the well-known British paper mill owners, has served his firm for 50 years, during which period he states that many changes have taken place in industry. Originally he was a mill hand, and from his minor and unimportant position he has worked himself up to the presidency of the company—a position he now fills with the confidence and respect on the part of his fellow directors and every employee in the firm. Aye much of appreciation, Mr. F. E. Becker, the well-known pulp importer, has presented Mr. Moseley on behalf of the trustees with three silver-gilt spearguns. The presentation took place in St. Paul's, and Mr. Becker in a very able speech laid stress on Mr. Marsden's loyalty to his firm and the high opin-

ions the late Mr. James Marsden had of him. A more happier selection of a person to make the presentation than Mr. Becker could not have been made, because Mr. Becker was one of Mr. James Marsden's closest friends, and he was, therefore, in a position to voice the feelings of all concerned in making the presentation. The largest of the spearguns bears the inscription: "From mill lad to chairman, Messrs. Charles Marsden & Sons, Ltd. 1863—1913." Mr. Moseley is a magistrate, and has a large circle of friends inside and outside of the paper industry. He well remembers the day when paper could not be bought under 12 cents a pound.

WALMSLEYS START NEW MACHINE.

The well-known firm of Messrs. Charles Walmsley & Co., Ltd., papermakers' engineers, Bury, have just started up a 126-in papermaking machine at the Don-side Mill, near Aberdeen, Scotland. The machine has been built for turning out newsprint and reports to hand show that everything has given complete satisfaction. Good class printings are also turned out at this mill, and it is in the fortunate position of having the order book well filled so that the machinery will be kept running at full capacity for some months ahead. There is talk of a new paper mill being built at Northfleet, a short distance from the Imperial paper mills. This new concern will have good facilities in the way of transport, and raw materials can be unshipped right at the mill door. The Imperial Paper Mills, which are at Gravesend near the mouth of the river Thames, has eight papermaking machines running daily and the directors intend putting in more. They have now five calenders working, automatic water softeners and various other kinds of up-to-date machinery. Indeed, most of the paper mills now in England have been brought well up-to-date, or, are being brought, and a notable feature is the introduction of electricity. The Culter paper mills have an electric railway which penetrates into the buildings, as well as being outside, and naturally the transporting of paper and raw materials is carried out very quickly.

NEWCASTLE-ON-TYNE.

Judging by the particulars obtained at the Newcastle-on-Tyne dock, the past year has been a very successful one all round for this important centre of industry. Wood pulp is landed at this dock from Scandinavia and even Germany, and there are also supplies of esparto received from various sources. The happy state of affairs on the Tyne is due to the big trade "boom" but it has also been promoted by the entire absence of industrial disputes, which in 1912 hampered business operations to a very serious extent. Wood pulp in 1913 was imported to the extent of 35,014 tons, an increase of 19,432 tons, while esparto amounted to 4,665 tons, a decrease of 797 tons. The quantity of the dock, though the business in this raw material of wood pulp received constitute a record in the material has been steadily increasing for many years. In 1891, for instance, the quantity imported was only 523 tons and in 1900 it had reached the total of 8,229 tons. Five years later the figures increased to 10,715 tons, while last year the enormous quantity of

35,014 tons were brought to the dock. These figures show the growing demand there is for pulps in the Lancashire and North of England districts, and these are facts that Canadians should not overlook. Preston is also a rising port, good supplies of pulp arrive here from Nova Scotia amongst other places. Some uneasiness was caused recently at Preston by the steamer "Helen" being 8 days overdue. She had a cargo of wood pulp from Nova Scotia, but rough weather at sea delayed her on the voyage, and she eventually arrived safely.

CHINA CLAY.

The harassing experience which producers of China clay in England have had during the strike last year has prompted employers to come to some sort of an arrangement with their workers to prevent another stoppage of work. With this view the West of England and Great Beam China Clay Co., Ltd., have signed an agreement, along with representatives of the Workers Union, whereby all grievances are rectified and it is also stated, according to the last clause, that "This agreement shall continue in force from February 1914 to February 1917. During this period there shall be no stoppage of work either of a partial or general character, but in the event of any question arising, the representatives of the company and of the society shall endeavour to affect a settlement. Failing a settlement the question shall be referred to the arbitration of the Trade Board, and any decision arrived at shall be retrospective, and such decision shall be final and binding on both parties." This is considered an excellent clause, as it affords protection for both masters and men. It is stated that members of the Workers' Union, non-members of the union, and the employers themselves, are well pleased with the terms of the agreement, so that so far as the West of England and Great Beam China Clay Company—one of the largest employers in the industry—are concerned there will be no difficulty during the next three years in supplying Canada and the States with the necessary paper filling. The agreement also gives one an idea as to the way to avoid strikes.

PARCELS POST.

(Special to Pulp and Paper Magazine)
Ottawa, February 12.

Rates and regulations for the Canadian parcels post have been announced and have been greeted with a great deal of interest by the pulp and paper trade, upon which the commencement of the new system of transportation of parcels to-day, will have an appreciable effect. The rates of postage will be as follows: Within a radius of twenty miles from the place of mailing, 5 cents for the first pound and 1 cent for each additional pound up to four pounds, and 2 cents for each subsequent pound up to eleven pounds.

Within provincial boundaries outside the twenty mile zone, 10 cents for the first pound and 4 cents for each subsequent pound.

From one province to another, 10 cents for the first pound and 6 cents for each additional pound, with an additional charge of 2 cents a pound for each province which has to be crossed to the destination of the parcel, up to a maximum of 12 cents per pound.

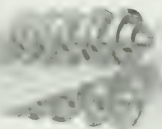
Besides its results in providing a cheaper method of transportation, the parcels post will provide an additional demand for pulp products in the form of suitable containers for eggs, butter and the like, which are expected to be sent through the mails in large quantities.

Slitting and Rewinding

Cameron Machine Co.

The slitting and rewinding of paper is a process which increases in difficulty in proportion as the requirements call for clean, accurate slitting, coupled with firm, even rewinding. First-class work has become a prime necessity, owing to the enormous quantities of roll paper now used in automatic wrapping machines, computing and recording machines, continuous printing, electrical insulation, and a hundred and one new processes arising almost daily. The defects of the machines familiar to practical men for a generation, are serious defects, and can be avoided only by a radical change in the design.

A moment's thought will show that the problem of the best way of slitting paper cannot be solved with-



Shear Cut.

out keeping in mind the fact that it must be rewound at the same time that it is slit. In short, the two operations of slitting and rewinding are interdependent, and really constitute one continuous operation. It would seem that this fact was so clear, it need not be stated here, yet machine designers are apt to overlook it.

Broadly speaking, the older style machines have followed one and the same slitting method, the rotary shear, worked up in one form or another, and the results have been far from satisfactory.

This interrelation of the two operations of slitting and rewinding is described in an interesting way in the patents covering the Cameron machine, the latest of which is dated October 21, 1913, which is quoted in part as follows:

"The problem of slitting paper has formerly been considered as being distinct from the problem of re-



Cutter complete with adjustable spacer, showing also a spacer without cutter.

winding it. In other words, it has not been realized that it is necessary to have a particular kind of rewinding device in order to effect proper slitting of the material, nor has it been understood that in order to rewind the slit sections properly, it is necessary to have a particular kind of slitting device. Yet, the two problems are, in fact, interdependent and really constitute one unitary problem. Thus, if the rotary shears are used for slitting the paper, the shearing action necessarily displaces the edges of the material. The shears

overlap each other and the paper must be pushed aside and stretch somewhat at the point where the shearing takes place. When it is attempted to rewind the slit sections which have thus been distorted it is found that the rewinding device will operate inefficiently, because in rewinding, the sections are apt to overlap or interweave, instead of being entirely separate coils. The foregoing will also result in building the coils much higher at the points where they interweave than at other points and will thereby throw the rewinding device out of proper operation.

"It is found therefore that only by combining a particular kind of slitting device with a particular kind of rewinding device can the proper result be obtained. For the slitting device, a score cutter (as described later) is most suitable. The score cutter, unlike the rotary shear, does not stretch or distort the slit section of the paper. By this improved device, the slitting process is accomplished in a way which leaves the edges of the paper slit perfectly even and smooth and lying side by side without possibility of stretch or distortion, so that the rewinding may be effected without overlapping or interweaving.

"The cutting discs which thus sever the paper, act under a yielding spring pressure against the smooth and glass hard surface of the cutter roll. The edge of the disc need not be acutely sharp, but is preferably slightly blunt, like the edge of a cold chisel, while the quality and temper of the steel from which the discs are made is such as to insure the maximum of hardness and toughness without brittleness. The pressure of the discs against the cutter roll may be varied to suit the work.

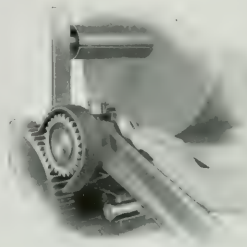
The cutter roll against which the cutting discs act in severing the paper has a smooth, hard surface, which resists the effect of the cutters and prevents them from marring it with grooves. The surface of the cutter roll is preferably made up of several hollow sections or shells mounted on a centre core shaft. By this method a surface of flawless hardness and smoothness is obtained. The ends of the sections are accurately ground, so that the joints between them need not be considered in respacing the cutters.

"The rewinding mechanism consists of a pair of supporting rolls, of which the cutter roll is one, together with a pressure roll, which rides upon the upper

desired, may carry spools or cores for the reception of the coils."

The pressure roll is so mounted as to be always exactly parallel with the support rolls, so as to keep the coils of uniform diameter with respect to each other.

For the purpose of more firmly coiling the strips this pressure roll is rotated at somewhat greater surface speed than the supporting rolls, and in order to permit of adjustment a friction clutch is interposed in the line of gearing so that the speed may be varied.



Resharpening Attachment, operator can put cutters in prime shape with little trouble.

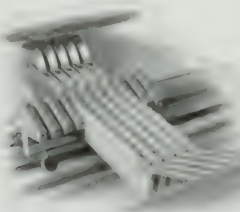
The pressure of the roll bearing upon the coils may also be regulated.

From the foregoing, it will be evident that as the web of material comes between the cutter roll and the cutter discs, it will be severed into strips of the desired width without distorting the strips with respect to each other, and that the strips by reason of this non-distorting action of the cutters will then pass on to the rewinding mechanism in true side by side relation without any overlapping or interweaving. The rewinding mechanism thus receives the cut strips in true side by side relation and is capable of rewinding them into coils of uniform diameter which will readily separate from each other on being removed from the machine.

ADVANCE IN ROSIN PRICES.

The depression consequent to the process of the disintegration and readjustment of a monopolistic naval stores trust seems to have spent its force in the rosin market. This view is based on the fact that prices for the different grades of rosins have shown slow but persistent strength since last October. Red rosins, which commanded \$8.00 a barrel a few years ago, could be bought as low as \$3.90 last fall, while an average drop of \$2.00 to \$3.00 was occasioned in all of the higher gradings. The long decline and the uncertainty surrounding the market naturally called for conservatism on the part of consumers and during the greater part of last year the demand was quiet with buyers restricting operations to actual wants. Since the turn of the year, there has been some quickening to the volume of trade at Savannah. Exporters are interested in the primary market and recent heavy purchases are taken as a reflection of their belief in the intrinsic worth of the product.

It is of interest to note the restoration of normal trade conditions after the demoralization of 1913. In addition to a production in excess of actual needs, the market was forced to submit to the unloading of some 150,000 barrels representing an approximate value of \$4,500,000 accumulated by the American Naval Stores Company. The difficulties that overtook the company



Cutters mounted in Gang Spacing Block. These blocks are made in sections 6½ inches long, slotted for any spacing required. A rapid method of respacing.

surface of the coils and holds them in uniform contact with the support rolls. The support rolls are spaced quite close together and rotate in the same direction, so that the rolls resting upon them will be caused to rotate at uniform speed by surface contact. The coils are all wound upon the same arbor, but this arbor, if

in the suits brought against it under the Sherman anti-trust act were increased by its financial obligations incurred in swinging the market, and further entanglement ensued in the stringency of the money market.

Notwithstanding that the Supreme Court of the U.S. had reversed the decision of the lower court, voluntary liquidation became necessary. In consequence of the breaking up of the big company as it existed three years ago, a number of independent corporations have sprung into existence and the ranks of the wholesale trade, accordingly, have been greatly enlarged.

The increase in the number of distributors is the real cause for the healthier hue which surrounds the market at present. It now seems assured that in dull times there will be spirited competition among the factors. At present it should be recalled, however, that the market has been put to a very severe test, prices have shown an abnormal decline and stocks have gradually passed from weak into strong hands. Factor's opinions convey the idea that they have the situation well in hand and will see to it that the production next season will be largely reduced. The policy of the larger factors will be, "Not a dollar for cutting boxes, buying cups, purchasing timber or leasing old boxes." The effect: A scarcity of the finer grades and of the very low grades another season.

The approximate receipts of rosin in barrels at all ports for the years named were:

1901-2.	2,200,000
1902-3.	2,180,000
1903-4.	2,000,000
1904-5.	2,100,000
1905-6.	2,000,000
1906-7.	2,150,000
1907-8.	2,100,000
1908-9.	2,250,000
1909-10.	1,900,000
1910-11.	1,750,000
1911-12.	2,100,000
1912-13.	2,250,000

To these figures should be added the rosin moved from points of production direct to the West, which is lighter proportionately than the corresponding movement of spirits of turpentine. This is demonstrated by the number of barrels of rosin handled at the ports as compared to the number of barrels of spirits of turpentine. The ratio of production is about 3.45 round barrels of rosin to one barrel of spirits of turpentine. Whereas the rosin taking last season as a basis, handled at the ports was about 3.88 round barrels to one barrel of turpentine.

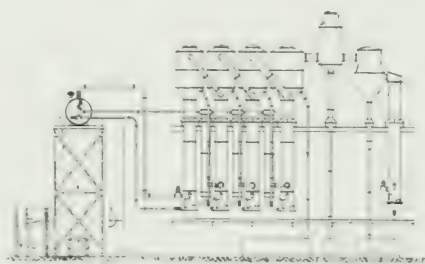
Visible stocks at Savannah at present are 161,692 barrels compared with 133,597 barrels at this time last year. Shipments so far this season are 409,466 barrels against 634,645 barrels for the corresponding period of the previous year. The new producing season will not become active before April, domestic consumers are not carrying heavy stocks and the market appears to be in a condition to respond to any increased inquiry which may develop.—Paper Trade Journal.

KESTNER DIRECT FIRED EVAPORATOR FOR CAUSTIC SODA.

The economical concentration of caustic soda liquors is one of the most important problems in the chemical industry. In some works it is still effected by steam coils placed in tanks, though in most it is done in multiple effect evaporators, the steam for heating these evaporators being taken from steam boilers.

Several attempts have been made to concentrate caustic liquor direct in boilers of the Lancashire or similar type, but experience has shown that it is impossible to keep the joints tight, as caustic will gradually find its way through almost any riveted joints in such conditions.

The problem has been completely solved by the Kestner patent direct fired evaporator, which is shown at A in Fig. 1. The chief features in the construction of the evaporator are: That the upper and lower drums are arranged so that there are no riveted joints in the



plates; the form and arrangement of the tubes is in accordance with the Kestner patents, and this arrangement is such that perfect circulation takes place; the return tubes being free from direct fire heat.

This evaporator has been at work in conjunction with the ordinary type evaporator working under the following conditions. The thin caustic liquor at 20 deg. Tw. is taken through a heater and then into the Kestner evaporator. The density is raised up to 40 deg. Tw. and vapour generated at 60 lb. pressure. The vapour is used to heat a double-effect pan of the ordinary type.

In tests made on this direct fired evaporator 8½ lb. of water were evaporated per pound of fuel, Lancashire coal being used. It is unnecessary to elaborate such figures, as they speak for themselves.

While the Kestner direct fired evaporator can be applied to existing installations in this way, the ideal plant is shown in the diagram. In these plants the Kestner is arranged as the first effect and followed by a triple or quadruple effect Kestner standard climbing film type.

A series of heaters is provided to heat the liquors before entering the first effect or boiler. This plant takes the liquor at, say 20 deg. Tw., and concentrates up to 100 deg. Tw., thus reducing the cost of concentration to a lower figure than has ever before been realized.

There is no doubt that this direct fired evaporator will be the means of reducing the cost of caustic soda concentration, while at the same time it has a further advantage, when there is a shortage of steam in existing plants, of relieving the boilers from supplying steam to the evaporators. Altogether, it is a notable advance on present-day practice.

A meeting of the bondholders of the Omatahouan Falls Paper Company will be held in the office of the Royal Trust Co., at Montreal, on February 27th. It is understood that the meeting has been called for the purpose of authorizing the transfer of the latter company to the Chicoutimi Pulp and Paper Company, who already own a controlling interest in the company.

UNITED STATES NOTES

Peter Thom, who has been with the Kimberly-Clark Company, at Neenah, Wis., for 31 years and most of that period general superintendent, has resigned, announcement of which was announced on February 1. The resignation of Mr. Thom as general superintendent does not mean that he severs his connection with the company, but simply that some of the duties of his position will be shifted to younger shoulders. He will remain a member of the Board of Directors, will retain his stock in the company, and in addition will serve the company in an advisory and consulting capacity. He will have an office in the newly-equipped office building at Neenah. Mr. Thom as general superintendent will be succeeded by James C. Kimberly. There is no better known paper manufacturer in the Middle West than Peter Thom. It is said that he has a record equalled perhaps by none other in this country for turning out paper mill superintendents and expert machine operators. Several years ago Mr. Thom slipped, and in the fall sustained an injury to a hip. From this he has never thoroughly recovered. Because of advancing years and on account of the trouble given him by his injured hip, he has for some time sought to be relieved of the arduous duties of general superintendent of a string of mills as those owned by the Kimberly-Clark Company.

The annual meeting of the Eastern-Straw Board Company was held February 2 at Versailles, Conn., and the following officers were elected: Thomas F. Garvan, president; John S. Garvan, vice-president; A. J. Straw, secretary; Wm. Foulds, treasurer; E. A. Lydall, assistant treasurer, and W. E. Lydall, superintendent. In an interview with the Paper Trade Journal Tuesday, one of the officers stated that this mill is running full time, and has plenty of orders. There is to be an increase in the number of dryers, which will materially increase the production.

The annual meeting of the King Paper Company was held last week at Kalamazoo, Mich., and reports show that the company during the past year experienced exceptionally good business, although the year was not up to the standard in a business way. The officers and board of directors were re-elected for the ensuing year as follows: A. L. Pratt, president and manager; John F. King, vice-president and superintendent; George Davis, treasurer; H. B. Colman, secretary. The company is capitalized at \$1,000,000.

Frank L. Moore, President of the Newton Falls Paper Company of Watertown, N. Y., was in the Adirondacks last week, where his company is carrying on extensive lumbering operations this winter. About 30,000 cords of pulp wood are being cut about the Cranberry Lake region and about 20,000 cords in the West Oswego Lake region. From one-half to two-thirds of the wood to be cut is now on the lakes and rivers ready to be floated to the mills as soon as the spring freshets come. If the present weather continues, lumbering operations can be carried on without interruption for some time. The log roads have been in excellent condition this winter and there has not been too much

The annual meetings of the various companies of the Remington-Martin group of paper mills in this section were held in the offices of the company in last week when the officers and directors for the year were elected, and the annual report presented. The reports of Francis M. Hugo, treasurer, and Robert H. Buck, secretary, concerning the business of the companies during the past year showed that the business had been very good. Two changes were made in the official status of the companies. John A. Remington, son of the late Charles H. Remington and grandson of the late Charles R. Remington, who died last fall, was elected as vice-president of the Raymendale Paper Company, and the Norwood and St. Lawrence Railroad Company. Louis Bittner, of the Manufacturers Paper Company, of New York City, which handles some of the products of the Remington Companies, was made a director of the Remington Company, to succeed the late Charles R. Remington.

Having been interested in the paper business for many years in Northern New York, although for the past few years being in other lines of business in Carthage, John A. Hyer expects to leave for Montreal shortly where he will re-enter the paper manufacturing business, having an interest in a new paper mill that is to be built there soon. Mr. Hyer went to Carthage in the winter of 1897, and started the first two paper machines that were set up in Carthage, they being in the Carthage Tissue Paper Company's plant. He was later interested in the LeRay Paper Company, and was one of the original builders of the mill at Carthage. He was for a time the general manager of this company.

The Interstate Commerce Commission has authorized the Ocean Steamship Company of Savannah, for itself and carriers interested in its Tariff I.C.C. No. 315, to change the description of this newsprint paper classification to read as follows: "Paper printing (calendered or machine glazed, not enamelled), in boxes, crates, rolls or bundles, carload, minimum weight 40,000 pounds." This will apply on shipments from what is known as the Eastern cities, to Savannah.

Delegates of the Pulp, Sulphite and Paper Makers' Union and the International Paper Makers' Union of Maine and New Hampshire met at Portland, Me., several weeks ago for a regular conference. None of the officers gave out any statement, except that the meetings were harmonious, and that practically all of the changes that are to be embraced in the new schedule to be presented to the manufacturers were considered. It was learned that nothing of a drastic nature was deliberated upon, and they expect the manufacturers to look upon the new schedule, which is planned to run for several years, with favor, as it is but little different from the one now in force.

Due to the destruction of the beater house by fire, the manufacturing plant of the Munising Paper Company at Munising, Mich., is rebuilding, probably will require 60 days. The damage is estimated at \$40,000. The fire at the plant was the second within a week.

The coal shed was destroyed on the first occasion, with a loss of \$15,000. The mill manufactures manila wrapping paper.

About 400 New York stationers and their wives dined on Feb. 2 at Delmonico's New York, making the close of the ninth year of the New York Stationers' Association. President H. W. Rogers made a brief address relating to the welfare of the association and introduced George M. Courts of Dallas, Tex., president of the National Association, who made reference interestingly to trade matters of national scope. Among those present were: William H. Brooks of Philadelphia, G. E. Damond of Boston, Charles E. Falconer of Baltimore, Mr. and Mrs. R. S. Bauer of Lynn, Mass., Millington Lockwood of Buffalo, Mr. and Mrs. E. E. Huber and Mr. and Mrs. F. D. Waterman.

Francis H. Dewey, president of the Mechanics National Bank of Worcester, Mass., who was appointed receiver for the Farley Paper Co. of Wendell, on Nov. 18, by Judge Dodge in the U.S. District Court, filed his first report on the affairs of the company on Feb. 2. He sets forth that the firm owes \$106,000 and has assets of \$57,531. The assets consist of real estate valued at \$40,460, stock on hand \$9,000, accounts receivable \$7,161.50, and cash on hand \$1,809.97.

Paper box manufacturers are prosperous and jubilant. Practically all of the 300 delegates present at the opening session of the Western Paper Box Manufacturers' Association convention at the Hotel Wisconsin, on January 28, agreed that the industry has never seen such a good year as the one just past. They expressed the sentiment freely. Public demand for the sanitary packing of edible manufacturers has done more to increase the demand for paper boxes than the 3,000 makers in the United States and Canada could have done by the most extensive advertising campaign imaginable," declared one delegate. "The cracker-men started in putting biscuits in pound packages," said Egbert B. Hoy, editor of the American Box Maker. "Now butter as well comes in paper cartons, and a thousand and one other solids which can be dry packed are put up in paper boxes to insure their sanitary condition when they reach the consumer."

A hearing on the foreclosure suit brought against the Paper Box Company will be held before Judge John H. Kirkham in New Britain, Conn., March 3. Deputy Sheriff Harlan B. Morton is acting as keeper of the plant.

The Edward Balf Company of Hartford, has filed a certificate increasing its capital stock to \$241,900 by the issue of 338 shares at a par value of \$100, subscribed by Maurice B. Welleh, Edward Balf and Lucius B. Barbour, of Hartford. The Waterbury Paper Box Company of Waterbury, Conn., has increased its capital stock from \$25,000 to \$50,000 by the issue of 250 shares at a par value of \$100. The certificate is subscribed by Harry A. Hemmingsway, Merritt Hemmingsway and William H. Beers, a majority of the directors.

Theodore M. Byxbie, receiver of the defunct Capitol Manufacturing Company, makers of paper boxes in Hartford, Conn., reported to the Superior Court that the business was stopped last March and the assets sold in piece meal for \$1,145.52. Wage claims have been paid, and the receiver has \$806.23 on hand. No

claims have been disallowed and \$7,652.83 of general claims have been allowed. The report was presented by Anson T. McCook, the receiver's attorney, and accepted by Judge Greene.

The annual dinner of the superintendent and forcement of the New England Box Company was held at the Mansion House Boston, Mass., on Feb. 1. There were 45 present. B. W. Porter, president of the company, after a short address, called upon E. D. Chase, of Charlestown, N. H. E. A. Shepardson of Baldwinsville, and W. M. Baker, of Greenfield for addresses.

A work of development and installation of more improved facilities for the manufacture of paper at the plant of the Schmidt-Ault Paper Company at York, Pa., has shown considerable progress since last year. Additional paper making machinery is being installed and with the increased capacity the company will double its output. Its product will amount to 40 or 50 tons daily, or an average of about three carloads of wrapping, building carpet lining and other grades of paper. The first step of improvement has been the erection of a machine room, 260 feet by 80 feet in dimensions, of brick, steel and concrete construction. The building is fireproof throughout, having a concrete floor and a roof of slow burning material. It is more than several times the size of the old machine room, and has all conveniences for the employees, being well lighted and ventilated. Hundreds of windows face the north, south and east sides of the building.

One of the oldest paper houses in Baltimore, Md., passed out of existence when the Whitaker Paper Company of Cincinnati, O., purchased the Smith Dixon Company, Incorporated. Under the law, the business of the Baltimore Company will be conducted for a year under the present management, and will then go into the control of the Whitaker Company. It will be known as the Smith Dixon Company Division. The Smith Dixon Company was organized about 1866. Advisers from Cincinnati state that the Whitaker Paper Co. proposes to increase its capital stock from \$500,000 to \$1,000,000 to take care of new enterprises. Directors have approved the plan which will be submitted Feb. 27 to stockholders for ratification.

INTERNATIONAL PAPER CO.

Special to The Pulp & Paper Magazine.

New York City, February 13, 1914.

The International Paper Company, whose executive offices are at 30 Broad Street, this city, will issue its report for the year ended December 31, 1913, within the next few days. According to advices from officials of the company it is not expected that any changes of consequence will be shown, as compared with the preceding year. There was no material change in gross earnings and the surplus available for dividends showed a slight reduction from the 1912 figures, which showed a balance available for dividends of \$1,187,678, equivalent to 5.34 per cent on the \$22,406,700 preferred stock.

While net earnings will not be quite so large as in 1912, it is stated that the company's financial position has been improved considerably. During the past twelve months the company has retired a considerable amount of debt, has made large expenditures in the building of dams, etc., and has charged off liberally for depreciation. Philip T. Dodge, president of the

company is working strenuously to entrench the company in a strong financial position. His past success in this direction with the Mergenthaler Linotype Co., is well known.

The placing of newsprint on the free list under the new tariff law has not resulted in any material reduction in newsprint prices by the International Paper Co. Most of its newsprint contracts run for one year, and contracts recently closed have been at approxi-

mately the same figures as for the previous year.

International Paper Co. estimates that the consumption of newsprint in the United States and Canada last year was between 7 per cent. and 7½ per cent. in excess of that for 1912. President Dodge figures that if all the newsprint mills in the United States and Canada were to run at full capacity under normal conditions, the total production would be only 6 per cent. or 7 per cent. in excess of the total consumption.

The Beaver Company at Thorold

Toronto, February 13,

To complete a half million dollar plant within a year from the turning of the first sod is certainly accomplishing something out of the ordinary, yet this is what is being done at Thorold, Ontario, where the Beaver

is rumored that the company have arranged for a large supply of rossed wood through a Quebec firm.

The new Thorold plant is an immense affair being erected of steel and concrete, of the factory type, with numerous windows on all sides and sky lights. The wood fibre machine will extend the length of the main building of the plant, the dimensions of which are 350



Companies, Buffalo, are rushing the installation of machinery in the second factory which they have built in Canada, the other being at Ottawa. Last month the annual sales convention of the Beaver Board Companies was held at Buffalo and occasion was taken by the party of seventy delegates to pay a visit to the plant at Thorold. The visitors were delighted with the progress of the work and watched with keen interest the

feet long and 150 wide, with an extension of 150 x 74 feet to the north end and another of 150 x 150 feet to the south end. There are four well equipped, up-to-date buildings in all, and the engineer in charge of construction is E. E. Whitney. The Grand Trunk Railway has a siding running down to the plant while the shipping facilities by water on the Welland Canal will be all that can be desired. The Beaver Board



installation of the huge rollers on the wood fibre machine which is the largest of its kind in the world, and will have an output of from sixty to seventy tons per day of Beaver Board made from pure wood fibre. It

companies, of which W. F. MacGlashan of Buffalo is President, and H. S. Lewis of Beaver Falls, N. Y., Vice President, expect that the new works at Thorold will be in full operation by April next.

Victoria Paper and Twine Company

Toronto, February 2nd, 1914.

Early next month the Victoria Paper and Twine Co., Limited, will remove into their new and splendidly fitted-up warehouse at 439-441 Wellington Street West, Toronto. It is less than four years ago that the company took possession of the present premises at 415 King Street West and for a long time these have been far too small and reserve stock had had to be stored in other buildings, which has been rather inconvenient. Last fall the directors decided to build a structure that would adequately meet their wants and the handsome "Victoria Building," by which name it will be known, is about completed. The edifice has a frontage of 50 feet on Wellington Street, and a depth of 210, and possesses four floors. The timbers used are the largest ever brought into Toronto for a mill constructed, stone and brick warehouse building. The



floors are of Georgia pine and maple, being five inches thick.

The offices on the first floor are finished in modern style. There are departments for the selling, accounting and other branches as well as the offices of the company, and finely equipped sample rooms. The private apartments are nicely arranged and a private telephone exchange and pneumatic tubes for sending orders to the shipping room will also be one of the features. The warehouse itself is of the latest type of construction, and made to stand the heavy strain necessitated by the large stocks carried. The plans were drawn up so as to give the best possible stock piling advantages and economies and afford the best shipping facilities. A railway siding will be built to the rear of the building for receiving and despatching car load quantities while smaller shipments will be made from the front of the building, where large steel rolling shipping doors are installed. Other facilities consist of two large freight elevators, modern warehouse trucks and revolvers.

Part of the structure will be used for manufacturing purposes, as the Victoria Paper Goods Company (which is the manufacturing end of the Victoria Paper and Twine Co.) will remove from 80 Colborne Street to the new warehouse.

The officers of the Victoria Paper and Twine Co. are: President, Charles F. Hubbs; First Vice-President, Wm. H. Howe; Second Vice-President, R. W. Gallagher; Treasurer, H. J. Severance; Manager and Secre-

tary, Charles V. Syrett; Directors, Charles S. Nicholls and L. E. Charles. The business of the company extends all over Canada, and the directors look forward to even larger operations in their new quarters, which will afford improved service and enable the company to handle a wider range of unique and serviceable paper commodities. The management is composed of capable energetic salesmen, and the outlook for the coming year is regarded as of the most promising character.

TRADE ASSOCIATION IN NEW YORK.

Special to Pulp and Paper Magazine.)

New York, N.Y., February 12, 1914.

February is the month of conventions and banquets in this city in the paper and stationery trades. The week beginning February 16 the time set for four such gatherings. The National Paper Trade Association starts its annual meeting on Monday, February 16 and closes on Wednesday the eighteenth with a banquet and vaudeville show at the Waldorf-Astoria Hotel. Ladies are most cordially invited to attend this affair. On the same night as this association's banquet are two others. The Associated Dealers in Paper Mill Supplies of New York will dine at the Hotel McAlpin and the Stationers' and Publishers' Board of Trade will meet at the Hotel Plaza.

Wednesday and Thursday, February 18 and 19, are the days on which the thirty-seventh annual meeting and banquet of the American Paper and Pulp Association will take place at the Waldorf-Astoria Hotel. The first of these days will be devoted to the various divisional meetings which will take action upon any changes or trade customs. The next day will be devoted to a general meeting, when all divisions will report, and their action on any trade customs will be ratified and confirmed. Their will follow the election of officers and lectures and addresses on subjects of interest and importance to the trade. In the evening, the annual banquet will take place in the Grand Ballroom.

MacLAREN'S CASE.

Special to Pulp and Paper Magazine.

Ottawa, February 12.

One of the most important cases as affecting the interests of lumber, pulp and paper companies, which has been decided for some time was that of the MacLarens Company of Quebec versus the Attorney-General of that province. The case has caused a great deal of interest locally, as its outcome affects titles on the Gatineau and all other rivers of the same character flowing into the Ottawa River from the North. It arose out of a dispute over rights to the bed of the Gatineau at Pagan Chutes between the MacLarens and Hanson Brothers, of Montreal, and the Attorney-General of Quebec. The MacLaren Company are riparian owners; Hanson Brothers were granted water power privileges on the Gatineau and the Attorney-General comes into the case owing to his intervention on behalf of the latter firm to maintain the title which was given them in 1899. The MacLaren Company wins out as a result of the judgment, and is declared to own the entire bed of the river. The effect of the judgment, therefore, is that in rivers which are not navigable and do not allow the floating down of cribs of timber, owners of land bounded by the river bank own to the middle of the stream. People who own the banks on both sides own the entire bed of the river, although rights as regards the floating of timber and other such purposes are reserved in favor of the general public.

PULP AND PAPER NEWS

It is reported that a new box factory will shortly be established in Owen Sound and the promoters have been looking over several sites with a view to building there this spring.

A signal honor has been conferred upon Dr. B. E. Fernow, dean of the School of Forestry, Toronto, in being made President of the Society of American Foresters, which is the only organization of professional foresters in the western hemisphere.

The Montreal Engineering Company, Ltd., has retained Mr. Herbert S. Kimball, pulp and paper mill engineer of Boston, as consulting engineer in connection with one or two large paper mill projects which it is understood will be launched in the near future.

Robert Barber, formerly sales manager for William Barber and Bros., and for some time with the Barber Paper and Coating Mills Co., Limited, of Georgetown, has been appointed city sales agent for the Fred W. Halls Paper Co., of Toronto, and has entered upon his new duties. He is widely known in the trade.

It is understood that the Austin Paper Co. of Winnipeg, at the head of which is L. N. Austin, are having plans prepared by the Albertson Engineering Co. of Kalamazoo, Mich., and Toronto, for the erection of a board mill which will use flax straw for the making of board, and that construction will go ahead this spring.

The British American Wax Paper Co. of Toronto, of which H. B. Hart is manager, has, during the past few weeks, increased its facilities by fifty per cent by taking in a large portion of another floor in the Darling Building. Three machines for waxing paper are kept constantly in operation. The demand among bakers for waxed paper for bread wrapping is constantly increasing, and the outlook for the present year is reassuring.

The Bishopric Wall Board Company, of Ottawa, are in the market for 1,500 tons per year at least, of a rosin-sized chipboard 49¼ in. wide, put up in rolls not over 45 in. in diameter. Paper to Caliper 40 to 45 points, and stand a mullin test of at least 80. It should be waterproof and machine finished. It could be delivered at the rate of about 125 tons per month, starting the first of May.

The Welland Lumber Co., Limited, has been granted a charter with a share capital of \$100,000 and head offices in Welland. The company is empowered to carry on the business of timber merchants, saw mill proprietors, timber growers, etc., and to purchase and deal in timber lands and concessions. The incorporators are J. W. Rounding, Frank Edwards, George E. Tufts, George W. Hodgson and Ernest R. Tewsley, all of Welland.

The Provincial Paper Mills Co., Limited, with plants at Mill, Rochester, Thorold, and Georgetown, Ontario, will hold their annual meeting on February 18. The company, who have their general offices on the third floor of the Bell Telephone Building, Toronto, will shortly remove into larger quarters in the same building, taking over the offices at present occupied by the Toronto Harbor Commissioners on the same flat.

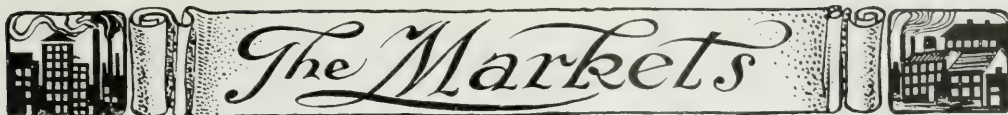
F. A. Ritchie of the firm of Ritchie and Ramsay, Limited, New Toronto, and Robert L. Patterson, manager of Miller and Richards, type foundry, Toronto, left this week to spend a couple of months among islands of the West Indies.

The Inland Pulp and Paper Co., of Thorold, Ont., who recently took over the plant of the Colonial Wood Products Co. in that town, and are now operating it, have secured a large contract for ground wood pulp, which will keep the mill running for six months longer. The Messrs. Eshelman are connected with the new company and under their progressive direction the outlook is bright.

W. J. Gage, President of the Kinleith Paper Mills, St. Catharines, and the W. J. Gage Co., Toronto, has made another splendid gift to the work of the National Sanitarium Association. His latest donation is one hundred thousand dollars, and the money will be used in providing for the maintenance of needy patients in connection with the work at Gravenhurst. Mr. Gage, who has for many years been a leading worker in the fight against the white plague, has made gifts toward the cause of over a quarter of a million dollars.

The annual meeting of the Kinleith Paper Mills, Limited, was held recently in Toronto, and very satisfactory reports were presented for the past year. Several improvements have been made during the past few months to the plant at St. Catharines, a large three-storey stock house being built of concrete and brick. There has been installed throughout the mills wherever possible, electric motors for running the equipment, power being obtained from the Ontario Power Company. Under the direction of the new superintendent William Anderson, late of the Milham Division of the Bryant Paper Co. of Kalamazoo, Mich., things are running smoothly. The former superintendent, A. A. Briggs, retired at the end of the year, as previously announced in the Pulp and Paper Magazine. W. J. Gage was re-elected President, W. P. Gundy, Vice-President and Managing Director; C. Stewart Patterson, Secy-Treas., and F. H. Gage sales manager.

The annual meeting of the W. J. Gage Co., manufacturing stationers, Toronto, was held recently, and the reports presented showed that the business for 1913 was ahead of that of the previous year, the directors reporting that the increase in the volume of trade east of the Great Lakes more than made up for the falling off in Western Canada. The figures show that the turnover almost reached a million dollars. All employees who have been in the service of the firm for a period of two years and over were given a bonus varying according to the length of employment and responsibility of duties, while the heads of departments are permitted to acquire stock in the company on very favourable terms. Mr. Gundy, managing director, reports that the profit-sharing plan, which was inaugurated some twelve years ago, has worked out advantageously to the benefit of the company and its employees. W. J. Gage was re-elected President; W. P. Gundy, Vice-President and General Manager; A. G. Parker, Secretary; H. H. Love, Treasurer; and H. F. E. Kent, Superintendent.



The Markets

CANADIAN MARKETS.

Toronto, February 9th.

There is no change to record in the news print situation, and prices remain firm. All the large plants are running on contract and there will not be any large renewals until April or May, when some of the present contracts expire. One outstanding feature is the large increase in shipments of print paper to the United States, the gain in 1913 being over 100 per cent over 1912. This has no doubt been brought about by the increased tonnage in Canada, which has shown an augmentation of more than 100 per cent in the last two years, and by the rescinding of clause two in the reciprocity agreement, admitting thereby all print paper under two and a half to the American market free of duty. According to a return just prepared by the Trade and Commerce Department, Ottawa for the calendar year of 1913, the total exports of paper to the United States were valued at \$5,754,156, as compared with \$4,221,220 in 1912. Of the total export of paper news print was the principal item, amounting to \$4,242,298 in 1913 as compared with \$1,989,863 in 1912.

Book and writing plants are not rushed, but business is more active for them, and the outlook is brighter. Wrapping papers are still being cut in prices and the mills are all eager after orders. Ground wood pulp demand is still quiet and unchanged. The market for sulphite is pretty firm and quotations are well maintained. The rag and paper stock situation is not very brisk in any line.

The prevailing quotations, f.o.b. Toronto, are:

Paper.

News (rolls) \$1.95 to \$2.00 at mill in car load lots.
News (sheet) \$2.15 to \$2.30, at mill in car load lots.
News (sheet) \$2.35 to \$2.75 at mill in less than car load lots.

Book papers (carload) No. 3, 3.75c to 4.50c.

Book papers (ton lots) No. 3, 4c to 4.50c.

Book paper (Carload) No. 2, 4.25c.

Book paper (ton lots) No. 2, 4.50c to 5c.

Book papers (carload) No. 1, 4.75c to 5.25c.

Book papers (ton lots) No. 1, 5.25c to 7.00c.

Writings, 5c to 7 1/2c.

Sulphite Bond, 6 1/2c to 7 1/2c.

Grey Browns, \$2.35 to \$2.75.

Fibre, \$3.00 to \$3.75.

Manila B., \$2.75 to \$3.25.

Manilla No. 2, \$3.00 to \$3.50.

Manilla No. 1, \$3.00 to \$3.75.

Unglazed Kraft, \$3.75 to \$4.50.

Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood at mill, \$15 to \$16.

Ground wood, \$22 to \$24, delivered in United States.

Sulphite (unbleached), \$42 to \$43, delivered in Canada.

Sulphite (unbleached), \$43 to \$44, delivered in United States.

Sulphite (bleached), \$56 to \$57, delivered in Canada.

Sulphite (bleached), \$58 to \$59, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87 1/2 to \$1.90.

No. 1 soft white shavings, \$1.70 to \$1.75.

No. 1 mixed shavings, 50c.

White blanks, 82 1/2c to 85c.

Ordinary ledger stock, \$1.20

Heavy ledger stock, \$1.40 to \$1.50.

No. 1 book stock, 70c.

No. 2 book stock, 45c to 50c.

No. 1 manilla envelope cuttings, \$1.10 to \$1.15.

No. 1 print manillas, 65c.

Folded news, 50c.

Over issues, 52 1/2c.

No. 1 clean mixed paper, 30c.

Old white cotton, \$2.50 to \$2.75.

Thirds and blues, \$1.30 to \$1.32 1/2.

No. 1 white shirt cuttings, \$5.00 to \$5.25.

Blue overall cuttings, \$3.50 to \$3.60.

Black overall cuttings, \$1.75.

Black linings, \$1.75.

New light flannelettes, \$4.50.

Ordinary satinetts, 75c.

Flock, 85c to 90c.

Tailor rags, 65c.

All foregoing prices for paper stock are f.o.b., Toronto.

Quotations f.o.b. Montreal are:

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.

Roam News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.

No. 1 Book, 5 1/2c to 6c per lb.

No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.

No. 3 Book M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.

Writings, 5c to 7 1/2c.

Sulphite Bond, 6 1/2c to 8 1/2c.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man., grey and red browns.

Wrappings.

Grey Brown, per 100 lbs., car lot, \$2.35; 5 tons, \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.

Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.

B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.

No. 2 Manilla, car lots, \$3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.

No. 1 Manilla, car lots, \$3.35; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.

Kraft, \$3.75 to \$5.00.

Fibre, car lots, \$3.35; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.

News quality, \$41 to \$42 per ton.

Bleached sulphite, \$54 to \$59 per ton.

Kraft pulp, \$3.60 to \$4.00.

Ground woods, No. 1, \$15 to \$16.

Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS.

Special to Pulp & Paper Magazine.

Office Pulp & Paper Magazine, 206 Broadway,

New York, February 13, 1914.

Shipments on old contracts have been resumed to normal movement since the first of the year, and a few new contracts have been made. Importers here have been anticipating an increase in price, and this has been realized in instances where offers have been cabled to Scandinavia pulp mills at prices that were well within the market range, and these were rejected. Inquiries have been numerous, and are increasing, but most orders are of spot nature. There has been a good deal of hand-to-mouth buying, but this is considered to be of only temporary nature, and it is expected that when contracts are made both in bleached and unbleached sulphite, mills will find a much stiffer price than is now asked. Sulphate and Kraft pulp have been rather quiet, and in some instances, it has been found necessary to curtail the expense of storage by selling at very narrow margin or even at a loss. The outlook is bright and a stiffening in price is expected by both dealers and importers.

Inventory at the mills during the past month found rather plentiful supplies of mechanically ground wood pulp on hand, and as a result there has been little demand for this product. There is, however, a small amount of business going on at prevailing prices, and local agencies are firm in maintaining the present quotations as a somewhat shortened supply is anticipated before long. Shipments on the balances of old contracts show that there is a growing activity among paper mills and if this condition continues, it is not improbable that anticipations of the trade will be realized.

There has been a small amount of business going on in rag stock, but at very low prices. Domestic stock has been exceedingly quiet, owing to the large supplies that accumulated at the mills last summer, when they had no orders. Dealers and importers are very hopeful of the future, and expect a considerable increase in price as soon as any demand sets in. Old bagging has been quiet for some time, but prices are well maintained. In old waste papers, soft white shavings have been in good demand, and fine in movement at \$1.80. This is attributed to the active demand for book papers. Flat stock and solid ledger have also been moving freely at \$1.00 to \$1.05, and \$1.65 to \$1.75. Strictly over-issue news has been in fair inquiry at prevailing prices. A growing demand for mixed papers has been felt in the past two weeks with an advance in price from 27½ to 32½. A falling off in the demand for soft shavings is anticipated, while the freer movement in boards and wrappings bids for a better demand, and an increase in the price of mixed paper.

Paper.

The first month of 1914 was rather good in the paper business in this city, the volume transacted in that time being far ahead of the two preceding months. General tendencies are toward a bullish condition in all lines. A good deal of pessimistic talk in the latter half of 1913 spread itself to the extent of producing what might be termed a "quiet panic." The houses that were doing good business were influenced by the general atmosphere, and in spite of the fair business they did, looked on the dark side of things and shook the confidence of all. When all completed inventory, however, there was found to be a different situation in reality from what was voiced. Last year proved a

very good one, when all accounts were checked. The psychological effect of this bit of knowledge, together with the completion of federal legislation that might influence trade, restored confidence and brought about a change in the tone of the market. This optimism is reflected in the entire commercial field of New York and paper is not inconspicuous in this. The turn of the year saw a great many orders and in two weeks the volume of business amounted to more than the whole month of December. The higher grades of writing have been in good demand, and prices have been well maintained. All new contracts for news have practically been made, and it is moving in good deliveries at 2c to 2.05c f.o.b. mill. Transient orders have been rather plentiful at 1.90c to 2.05c f.o.b. mill. There has been a somewhat shortened supply of side runs, but the condition now surrounding this line is a little easier. Manufacturers of book are several weeks behind in their deliveries, and they report no easement in the inquiry for their stock. Last year was among the best business years in that line. Tissues and Kraft have been rather quiet, but firm. Owing to the Brooks net weight and content of container law, which became effective February 1, jobbers have been trying to force out all rolls on their shelves, as the old stock did not have a guarantee of its weight or quantity as now required. This preparation left almost no activity in that line, as no orders are being placed with mills until these old stocks are cleaned up. The firmness of the tissue market was somewhat disturbed recently when certain mills, which probably had large stocks in over-production, offered No. 1 white at 40c, in ear lots, rather than hold out for the market value which has been maintained at 42½c to 45c on 1,000-ream and ear lots. A fair demand has been current for wrappings, which has shown a little easing in the past week, although prices are kept firm. This is thought to be only temporary, and a good many orders are anticipated in the near future.

The Board market has been a little quiet, but the total of last year's business was better than ever before. The first of February saw a change for the better and a rather hardening tendency in prices.

Quotations throughout the paper list are without a change and are repeated as follows:—

News, rolls, transient business \$1.95 to \$2.00 f.o.b. mill.
 News, sheet, \$2.10 to \$2.15 f.o.b. mill.
 Book papers, ear lots, C. & S.S., \$4.00 to \$4.20 f.o.b. mill.
 Book papers, ear lots, M.F.S., \$3.75 to \$3.90 f.o.b. mill.
 Writing paper, superfine, 11c to 13c del. east of Miss. River
 Writing paper, extra fine, 10½c, del. east of Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of Miss. River.
 Writing paper, No. 2, fine, 8c, del. east of Miss. River.
 Writing paper, engine sized, 4½c to 8c del. east of Miss. River.

THE BRITISH MARKETS.

(Special to The Pulp & Paper Magazine.)

London, February 3, 1914.

The dullness that prevailed in the British paper industry towards the close of the old year does not seem to have been lifted with the advent of 1914. Agents

SIEMENS BROS. DYNAMO WORKS

SIEMENS BROS. & CO.

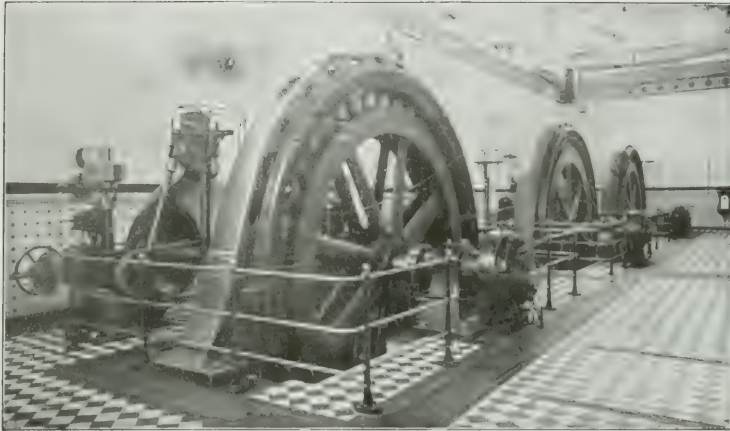
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1-1200 K. W. Lethbridge
1-800 K. W. Canadian Collieries
1-800 K. W. Dominion Coal Co.
2-675 K. W. Medicine Hat
1-750 K. W. Edmonton
1-750 K. W. N. S. Steel & Coal Co.
1-500 K. W. Wayagamack Pulp & Paper Co.

1-700 K. W. Canadian Collieries
3-500 K. W. Winnipeg
2-500 K. W. Port Arthur
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We undertake the complete electrical equipment of pulp and paper mills, collieries, steel works, rolling mills, cotton mills, woollen mills and electrical plants of every description, up to and including 110,000 volts.

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and millowners are complaining generally of the slackness of new business, and if it was not for the contracts on hand, and the orders served out by the Government and public bodies, it is feared that the paper trade would be in a bad way. It is true that the industry is feeling the after effects of the trade "boom," and the margin of profit gained is extremely small on what little transactions that are taking place. Some mills, however, are well supplied with orders for sometime past, but there are mills which keep up a steady output all the year round, and are in the happy position of having a good standing connection with their customers. January is also a time for stock-taking amongst the millowners. High-class printings are in fair demand there is also a good outlet in the export trade for newsprint. Esparto papers are dearer, and just at the moment manufacturers of this class of paper are experiencing a crucial time, owing to the increased cost of production.

The chemical pulp markets are in a quiet state, owing to the dullness of the paper trade, and prices at present are easier, but there is every likelihood of them becoming slightly harder or recovering themselves with a very short period. This featureless state of the market is only in common with other places, like France, Sweden and Germany, where business is said to be very bad. Norway is in trouble with the employees of the pulp mills, and if the unrest is not soon arrested, it is feared that by the end of February there may be a serious strike. This unrest has been going on for some months past, and now that a strong political element is at the back of it one never knows what to-morrow may bring. The pulp employees of Norwegian mills appear to have many grievances, and apparently they will not rest contented until they are allayed. Another fact is that since the strike in 1912, they seem to be in a restless mood and very little is said about it in either of the trade papers in Norway, Sweden, or England. A general strike, of course, means a jump in prices in London. At present, prices are c.i.f. London and other British ports:—

Bleached Sulphite	\$57.60	to	\$58.00
Easy Bleaching No. 1	41.45	to	43.20
Easy Bleaching strong	36.05	to	38.40
Soda Unbleached No. 1	37.20	to	39.10
Soda Unbleached (strong)	36.00	to	38.00
Soda Kraft	38.40	to	39.40

These are about the prices quoted for delivery during 1914-15, but the Norwegian crisis may disturb them at any moment.

The mechanical pulps market are very depressed and featureless, and importers report that nothing has been doing since the new year opened. Heavy shipments are arriving from Norway and Newfoundland sources. For mechanical dry the demand is practically stopped, and there is not even an enquiry reported. Prices to British ports, c.i.f., are as follows:

Pine 50 per cent moist prompt	\$ 9.00	to	\$11.00
Pine dry prompt	19.15	to	20.00

For forward delivery add another half dollar.

A very crucial outlook is reported in the Esparto trade. The supplies are limited, and prices in England have reached record figures, so that very little business can be transacted at the present levels. Those merchants who have not a good stock of Esparto on hand will find themselves in a very tight corner. As

things are at present an attempt is being made to raise the price of Esparto papers.

There is a considerable amount of business being put through in the chemical markets. Bleaching powder is steady at \$26, but spot supplies are \$1 extra. Soda Ash is moving off very well. Caustic soda is quiet, and is expected to continue so for some time—70 per cent being \$45 and 77 per cent \$48. Ammonia Alkali is in good demand, and quoted \$17.40 to \$19.20, according to package. Rosin values are higher and the demand since the beginning of January has been good. Sizing is firm and unchanged in prices.

Rags of all grades are in good request, but there is a scarcity and the new restrictions are interfering with supplies. Prices are very firm, and the same can be said of bagging, gunny and other papermaking materials under this heading.

The position of the China Clay producers is a difficult one at the moment. The demand exceeds the supply, and stocks are extremely low. Prices have advanced slightly, and it seems that the losses sustained during the late strike cannot be overtaken. Other fillings used by papermakers are unchanged, except to those who have not contracted, small parcels being charged up at heavy rates of an unprofitable character to the paper mill owner.

SCANDINAVIAN PAPER AND WOOD PULP.

The severe frost which has continued week after week without any interruption is reducing the water in our rivers and several mills already report a reduced output from this cause. Pulp grinding is also difficult in very cold weather, with a considerable reduction of the production as a consequence. The Swedish Upper Gulf ports have been closed to navigation by ice. Under these circumstances Mechanical Wood Pulp will probably become firmer.

There has recently been a little more demand for Sulphite Cellulose. Sulphate is very firm for delivery over the current year, but the many new Sulphate mills in Sweden tend to depress the market for long contracts.

ARGENTINE PAPER INDUSTRY.

Although working under favourable conditions, the papermaking industry has not made much progress, in spite of a protective tariff and an increasing home demand. The only paper mills with any claim to importance are the Zarate factories at Campana and Vicente Lopez. These mills are worthy of mention in connection with the manufacture of a paper strong enough for use as grain bags, tarpaulins for corn sacks, etc., for which the management claim to have discovered a process. The raw material employed is the wild taurara of the Parana river and the flax fibre.

The removal of the duty on paper is now being urged in the press, and a bill to that effect is at present before Congress.

The importation of paper is as follows:—

	Metric Tons.	
1909	18,600	2467,400
1910	34,400	623,600
1911	38,800	685,300
1912	38,300	618,900

The imports of paper for the press have risen from below 5,000 metric tons in 1900 to nearly 28,000 metric

tons in 1912. In the latter year the imports include 3,160 tons of writing paper, 570 tons of cigarette paper and 830 tons of wall paper.

In connection with the forthcoming annual meeting of the Canadian Pulp and Paper Association, which will be held in Montreal on February 26th, it is understood that an effort will be made to organize a jobbers' section where problems of mutual interest may be discussed. Speaking of the need of such a section, a leading Toronto wholesale paper man said: "I am strongly in favor of such a move, as there are many matters which might be considered to good advantage. Take the question of cartage rates, for instance. I see that the paper houses in Montreal have secured a one-cent rate per hundred pounds, whereas the rate on general merchandise is three and a quarter cents per hundred. Here in Toronto we have not got together, and the result is that we have to pay three cents per hundred, the advance of a few weeks ago being one cent. Think what a difference there is between the cartage rates on paper here and in Montreal—two cents per hundred pounds. Now, not to

speak of what we ship out, but referring only to the amount of paper that we get in every day—about thirty tons—the extra charge of two cents per hundred pounds on cartage means an added cost of twelve dollars per day. Figure that, for three hundred days in the year and the sum will reach close onto four thousand dollars extra in cartage charges alone. It is likely, in the meantime, that we will bring up the matter before the Toronto Board of Trade, to see if something cannot be done to adjust conditions.

The Holden-Morgan Co., Toronto, manufacturers of bread wrapping machines, have now turned out a dozen of these machines for leading Canadian bakers, and have several other orders which will keep the firm busy for several weeks. The machine is the only one invented that will use any kind of paper, waxed or unwaxed. The foreign patents of the company are controlled by Standard Wrapping Machines, Limited, who have effected arrangements to have the outfit made for the American market in New York City. A. P. Holden, of the company, has returned from a business trip to New York.

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MONTREAL, MARCH 1, 1914

No. 5

Association Team Work.

The recent annual Conventions of the Canadian Pulp and Paper Association in Montreal, and the American Paper and Pulp Association in New York, has called our attention to the benefits of organizations in the pulp and paper trade.

Our Canadian Association has been organized about a year, and is probably on better standing than any similar organization when it was but a year old. Of course, there are many big difficulties to be overcome in launching such an organization. There is a great deal of human inertia and blind selfishness among even progressive manufacturers, which a good live association must live down. We are glad to see that our association in Canada is having remarkable progress in this direction, and that progressive manufacturers throughout the country are not only members, but are enthusiastic in their support, and fully appreciate the benefits which may be derived from good team work in the manufacture of pulp and paper.

The immediate danger of tariff adjustments at Washington, is over, but these matters will again have to receive our attention in three or four years, and there is also the question of tariff matters in our own country, which we should agree to and on which we should make united representations to the Government. It is far easier for various manufacturers to settle their difficulties in association meetings than by competitive representations to the Government. The matter of gathering statistics of our own country and in foreign markets, in which we take a large share at the present time, is one of the most important phases of the work, and affords possibly the greatest scope for development.

We have heard for example of what an efficient organization can do, in the strong aggregation of manufacturers to the south of the line. One most important point which they have found, is, the efficiency studies in their mills, which has resulted in the saving of many thousands of dollars to many individual mills.

The Association has sent capable and trustworthy efficiency men into the mills, with instructions to collect confidential information, and which could only be released by the owner of the mill himself. The results of these investigations have been the greatest surprise to the owners of these very mills, with the establishing of costs on an accurate and scientific basis. Many mills were forced to change their line of products. Some grades of paper were being produced at a loss, which was made up by their grades which showed a greater margin of profit. It was necessary to turn the mill on to the grades for which it was best suited, and which it could manufacture to the best advantage. Information of this kind is available to all members of the association, who can profit equally by such investigation. The saving of wastes is an enormous item in pulp and paper mill work. This question can be discussed freely in an open and broad-minded way by competitive manufacturers at an Association meeting.

The greatest difficulty which a new organization of this kind has is the feeling of fear which individual members entertain toward their fellow members, and competitors. An old organization has lived this down, but it takes years for a new organization of men, many of whom are strangers to each other, to have that safe feeling, which is necessary to the most efficient carrying out of the purposes of these associations.

The old days of gentlemen's agreement regarding prices and territory, are entirely passed—it is found

impossible, until human nature changes, to maintain any such arrangements. Coming together around a common board table many competitors, who have regarded each other askance, have learned to esteem them as honest business men.

In an industry such as ours, which has so many variations, which may be studied with benefit to all members, it is quite impossible to appreciate how an industry of the proportions which the Canadian pulp and paper industry has grown to be, could remain in any loose and unorganized form. Trade abuses need correcting; fairness needs to be the motto between manufacturers themselves, as well as with their customers.

The Hardwood Lumber Association of the United States has proven what wonderful things can be done by organized efforts, by correcting such abuses. The scaling of lumber and grading, were at one time, in a state of chaos. They have now, however, assumed definite shape, and a manufacturer may rely on fair treatment. The trade feud has been overcome through many organizations in the United States, where men envious of each other have sought to do their competitor unto death. This as usual, strikes back at themselves, and also to other members of the industry.

An organization is the finest method of avoiding such difficulties. It is the greatest peace maker in industrial life.

We are glad to note and appreciate the benefits which have already come to the manufacturers of Canada through the young and growing Association of our pulp and paper manufacturers.

Ground Wood.

A recent article in the Pulp & Paper Magazine on "Power Consumed in Grinding Wood," has created considerable attention. In looking up further data on this line, it is found that there are some of the grossest examples of waste, inefficiency and poor management along these lines which one could find in any industry. There are many ground wood mills in the United States, and one or two in Canada grinding wood in localities where power is worth \$30. These same mills are paying as high as \$15 a cord for wood and selling, or, at least, trying to sell, their pulp at the present poor prices. It would pay these people far better to shut up many of their mills and sell their power to industries in their vicinity. There is at the present time in Canada alone many thousand tons of ground wood which is a drag on the market. Over-production has been extreme during the last few months, and the result is that the present prices of ground wood really only provide for conversion costs and pay little, if any, for power. The situation has grown very odd and, instead of getting out of business or getting their properties on an efficient basis, many of these ground wood mills, some of which are small, and a few of which are large, are

trying to manufacture, and spoiling the opportunities which a man situated with proper advantages is unable to reap the benefits from.

There are some new ground wood mills going up in Canada at the present time, which will aggravate the situation further, but there is no doubt that eventually it will adjust itself, although for the moment, the situation for the small producer looks rather gloomy. We think it would be well for all manufacturers of ground wood to study carefully their costs and the new discoveries, which have been worked out by the United States Government showing the most efficient methods of grinding, which have been adopted in a few mills in the United States with such wonderful results.

Profit Sharing in Timber Royalties.

A broad and new policy has been adopted by the Province of British Columbia in their new Bill recently passed regarding the increase in their Timber Royalties. The principle is advanced of profit sharing in natural resources for the people of the Province. This is a broad and new principle to be applied in this way, and is not an ideal policy as it is executed there, but is a policy based upon an ideal, and in that way must be most highly commended.

This Bill gives a fair and just measure of certainty to timber licence holders, and, therefore stability to our lumber industry. It somewhat increases present returns to the Government from timber royalty, and provides for greater and greater increases in the future; but the most fundamental thing in this Bill lies in its recognition of the profit sharing principle—in its recognition of the right of the people of British Columbia to share in the increasing value of their own timber property.

It is the product of several years of agitation and of more than a year of definite consideration of this whole royalty problem. This consideration has involved a thorough and practical investigation of the Forest Branch of the Department into lumber values and lumber costs, whose difference, less a margin of profit to the lumber operator, spells stumpage values.

The consideration of the royalty question has involved in the aggregate weeks of discussion. It has been approached by the Government with fairness and unflinchingly; and we are glad to say that it has been approached with a remarkable measure of fair dealing by most of the lumbermen themselves.

These three great purposes are as follows:—

First, so to settle this royalty question as to ensure to the highest practical degree the welfare of all the people of British Columbia as far as the forests contribute to their welfare, and that is very far.

Second, so to handle this question that the Government recoupates to the fullest legitimate extent in establishing and maintaining a permanent and profitable lumber industry in our Province; and, third, so to

handle this matter, as to make forest conservation not a remote but a nearer and more profitable thing upon all timber limits.

The increase of revenue from the forest provided for by this Bill has been treated as less important than other and more vital public considerations. That the Bill will increase revenues is a happy result. It would, however, be an unhappy result were it accomplished by violation of any one of the principles—the welfare of the people, the welfare of the lumbermen, and the welfare of the forests.

The passage of this Royalty Bill settles, and settles definitely, and settles fairly, the uncertainties of recent years, both for operator and investor, which have disturbed somewhat the stability of the finances of the British Columbia lumber industry.

The principle outlined in full in our news columns regarding this Bill, must be commended by all lovers of fairness and advocates of conservation. The increase in royalties graded every five years are adjusted on a base selling price of \$18.00, above that price every five years the Government takes 25 per cent of the profit. This is, indeed, a new departure in Timber Royalties, and its success will be watched with deep interest and tense anticipation by all interested in manufacture and use of forest products.

Editorial Comment.

In a lecture at McGill University dealing with watered stock and over-capitalization, Mr. David S. Kerr, C.A., remarked that there were indications that some action would be taken by the Government to restrain the watered stock artists.

It is purposed to have a law forcing corporations to set forth on their balance sheets what amounts, if any, represent goodwill, so-called.

This situation involves numerous holding companies owning and operating large subsidiary companies. Such a move is a token of a healthy development. This industry has suffered, perhaps more than any other, during the last few years by the operation of these high finance artists, and any movement to change the situation must be welcomed by all interested in the healthy development of pulp and paper enterprise and the progress of Canada in general.

* * *

"Le Progres du Saguenay," a paper published in Chicoutimi, and controlled by Mr. J. E. A. Duber, of the Chicoutimi Pulp Co., took a strong stand last week against Sunday work in paper mills. As pointed out recently in the columns of the Pulp and Paper Magazine, this is not necessary, and a mill can earn more money by eliminating entirely any regular Sunday work. The report of efficiency engineers of the American Paper and Pulp Association states that mill paper can be made by doing repairs on a Saturday shut-down. We heartily agree with "Le Progres du Saguenay" that Sunday work is unnecessary.

PULP AND PAPER FOR 1913 IN BRITISH COLUMBIA.

From Annual Report of Chief Forester.

The past year has been the first in which the pulp industry has fulfilled its early promise. Two mills have been in operation during the full year, the Powell River having constantly reached its daily capacity of 225 tons of newsprint. It should be noted that a small portion of this suffices to supply the Provincial market, while freight rates prevent the shipment of newsprint to points east of Alberta. A small quantity of newsprint is shipped to be distributed from Calgary and Edmonton, the balance (comprising over 75 per cent. of the output being marketed in the North western States.

The other operating pulp-mill of the Province, that of the B.C. Sulphite Fibre Company, on Howe Sound has operated at capacity during the year, producing daily 40 tons of a very superior grade of fibre. The market for this product is altogether outside of British Columbia. Seventy-five per cent of the output is sold in Japan; the remainder is sold to paper-mills in the North western States. The manufacture of pulp products on a large scale in British Columbia depends upon the solution of the problems of labour, transportation, and markets, the prospects for which are satisfactory. As for the prime essentials, this Province possesses natural resources of pulp-wood and water-power which are not equalled by any other Province in Canada, the water-power on tide-water alone being estimated to be 1,000,000 horse power, and many billions of feet of pulp-wood being tributary to this. When the trans-Pacific market for pulp products is developed, mills on tide-water in British Columbia will thus have great advantages in seeking trade. This market will sooner or later be essential to the success of the pulp industry in British Columbia, for the section of the Canadian population which under the present basis of fixing freight rates can be supplied by the mills of British Columbia in competition with those of Central and Eastern Canada will be the limited market west of Regina, while the new mills now contemplated or under construction in Alaska and the North western States will reduce the available market for the British Columbia product in the Western United States. Fortunately, after the completion of the Panama Canal, the trade routes of the Pacific Ocean will lead direct to the chief pulp and paper importing nations of the world. Asia presents a great undeveloped market for pulp and paper—a market demanding special grades produced by special machinery processes, and in time will require heavy shipments of low-grade papers and high-grade sulphite pulp. The Australian and South African newsprint market should also be supplied from British Columbia. The greatest pulp and paper market of the world is that extending from the Atlantic seaboard of the United States westward to Chicago.

The total value of the pulp and paper exported from British Columbia in 1913 was about \$3,000,000.

This survey of the present situation shows that the expansion of the pulp industry in British Columbia depends upon the same factor as the expansion of the lumber industry—namely, the development and extension of the export market. It is recognized that this work, which is so important to the public from the standpoint of revenue, should not be left entirely to private individuals. Already in 1913 the production of \$3,000,000 worth of pulp and paper has helped in the upbuilding of our commerce.

CASEIN---ITS PREPARATION AND TESTING FOR COATED PAPER WORK.

By E. SUTERMEISTER, Westbrook, Me.

In the manufacture of coated papers a mineral pigment, either white or colored, is mixed with an adhesive and spread by special machines as uniformly as possible over the surface of a web of paper. The function of the adhesive is entirely that of binding the pigment to the paper, so that it will not be removed by the type or plates during the printing process. For this purpose, casein is very largely used, having in fact almost entirely replaced glue which for many years was used for this work, practically to the exclusion of all other materials.

Casein is present in milk to the extent of about 3.0 per cent, and may be prepared from it either by the action of rennet or by means of acid. Since the rennet casein is difficultly soluble and is not used in the coating industry, it will not be considered here. Acid caseins may be prepared either by adding acid to the milk or by allowing it to sour naturally. The former method is largely employed in this country while in South America the latter method is the most general.

The procedure in making an acid casein may be briefly described as follows. The skimmed milk, from which the fat has been removed as completely as possible by centrifugal separators, is run into large, rectangular, wooden vats, and heated to about 120 deg. F. by blowing in live steam. To this warm milk is then added dilute acid in amount sufficient to slightly more than precipitate all the casein; at this temperature the clots of casein adhere to one another so that the whey can be readily drawn off. Hot water is then added, the steam turned on and the curd washed by working it over with wooden rakes. When this wash water is drawn off the curd is found to have drawn together into a tough, dough-like mass, and this is taken out of the vat, cut up into large pieces and allowed to drain on slanting boards or racks. This drained curd is then run through a disintegrator, which shreds it quite fine, and the shredded material is spread on wire covered racks and dried in a current of warm air. In making self-soured or natural-soured casein as it is sometimes called, the curdling is caused by the natural production of lactic acid. When thoroughly curdled the whey is removed by pressing in burlap bags and the pressed curd is then shredded and drier as usual.

The method employed and the care which is exercised throughout the operations are largely responsible for the grade of casein turned out. Muriatic acid gives quite a different product from sulphuric acid, and the self-soured is not exactly like either in its working properties. If the wet curd is not promptly dried it becomes mouldy and of inferior color and strength, and the same result is caused by too low a temperature in the drying galleries, which means that the curd must be left in them for an unusually long time under the best possible conditions for spoilage. On the other hand, if the drying temperature is too high, the casein turned out will contain a large proportion of red or orange-brown particles and its solubility is much impaired. Other conditions which tend to cause a low grade product are frequently present since it is often considered a by-product by the dairies or creameries producing it, and so gets attention only when the men can be spared. As it is necessarily produced in great-

est quantity when the milk supply is greatest, and the dairy the busiest, it is often neglected. Then again, the drying plant is expensive, so that one central plant is made to handle the green curd from a number of surrounding dairies and during transportation, especially in summer, this green curd has an excellent chance to deteriorate.

The caseins on the American market are received from France, Italy, Sweden, Russia, Denmark, South America, etc., as well as from numerous local sources. Since all sorts of processes are employed in these countries, and the care used is entirely problematic, it is evidently very desirable to have some method by which casein can be tested and its value determined. Although no entirely satisfactory tests, which can be applied by both the producer and the consumer, have as yet been devised, there are certain methods which are well worth considering.

In 1912 Hopfner and Burmeister published a number of analyses of technical caseins from which the following figures for moisture, fat, ash, and nitrogen have been taken:

	Maximum.	Minimum.	Average.
	%	%	%
Moisture	10.50	7.27	9.23
Fat	2.06	0.23	0.85
Ash	4.95	3.53	4.07
Nitrogen in sample as received	13.55	12.52	12.99

For comparison with these are given the following results obtained by the writer on numerous shipments of goods received in the American markets:

	Maximum.	Minimum.	Average.
	%	%	%
Moisture	12.3	5.4	9.64
Fat	9.9	trace	3.68
Ash	4.5	1.0	3.29
NaOH to make neutral to litmus	3.8	1.30	2.51

The wider variations in the American goods are probably due to the wider field from which they were drawn, as they are known to include a number of foreign caseins as well as a great many of domestic manufacture. The much higher percentage of fat may be due to actual difference in the caseins, but is more likely to be caused by the methods of analysis. Hopfner and Burmeister determined the fat by extraction with ether and petroleum ether which, in the hands of the writer, has been found to be very tedious and quite inaccurate, a portion of the fat always remaining with the casein. The results on American goods given above were obtained by a modification of the Babcock milk test, which was found to be more accurate and much more rapid.

In addition to these chemical tests, most of these shipments were carefully watched during use, and it was found impossible to trace any connection between the practical results and the analytical data. For this reason it was felt that small scale tests which would more nearly duplicate actual working conditions, would give more reliable information than could any

chemical analysis, and the rest of this paper is devoted largely to a discussion of such tests.

Casein is a body of an essentially acid character, which is insoluble in water; the addition of alkali, however, neutralizes the acid and forms a compound which may be considered as a caseinate of the base employed. The caseinates of ammonium, sodium, potassium and lithium are soluble, while those of the heavy metals are not, but since the latter do not come into consideration in the coating industry, and since, for reasons of expense, lithium and potassium are never employed, we are concerned almost entirely with solutions prepared with ammonia or some of the compounds of sodium. Of the latter the silicate, sulphite, phosphate, hydroxide, carbonate, borate, etc., have been proposed and used from time to time, but while the phosphate, carbonate, and borate are still very generally used the other three are not commonly employed. As a standard solvent for use in testing, we have then the choice of four alkalis, but because of the difficulty of handling ammonia and of keeping it at a definite strength it is practically debarred. Of the three sodium salts the carbonate has the disadvantage of causing much foam, which necessitates extra care in making the test, while the other two are easily obtained of good purity and are of about equal solvent power. There is really very little to choose between these two, but since borax has been for a good many years the alkali most used in solubility tests, there seems to be no good reason for changing now.

The specifications for solubility under which one of the largest concerns formerly purchased its casein were about as follows: One part of casein mixed with four parts of water and 15 per cent. of borax (on the weights of the casein) when heated to 150 deg. F. and stirred three minutes, should be completely dissolved when allowed to stand one-half hour. This test is thought to be too severe in several ways, and if it is strictly adhered to will cause the rejection of many caseins which will work perfectly in practice. The time of heating and stirring is not long enough, and the temperature may go much higher than 150 deg. F. without bad effects, provided the heating is not very prolonged. There are also found occasional lots which will not dissolve with less than 18 per cent of borax, though with that amount the solution is perfectly satisfactory.

As a substitute for the above specification, the following is suggested. The sample of casein shall be ground so that all of it will pass a 20 mesh screen, and after grinding the entire sample, shall be thoroughly mixed. Of this ground casein 100 parts shall be mixed with 400 parts of water and 15 parts of commercial borax and the mixture heated and stirred till solution has taken place. In making this test the following precautions shall be observed: At least 50 gms. of casein shall be taken for each test; the heating must be by means of a steam or water bath, and blowing live steam directly into the mixture should not be practiced; the temperature at which the solution is made shall not exceed 180 deg. F., nor the time of stirring 10 minutes. A casein to fulfill this test must give such a complete solution that no undissolved particles are observed when the solution is stirred in a glass vessel or when a clean knife-blade is dipped to the very bottom of the solution and then withdrawn.

Nearly all of the high grade caseins of the present day will pass this test, though, as noted above, there is an occasional lot which requires slightly more alkali. There is also another class of caseins which, when

tested in this way, show a little insoluble residue, generally in the form of white flakes, which may or may not dissolve on further heating, or the addition of a little more alkali. The acceptance or rejection of a casein of this class depends on the particular purpose for which it is to be used, and on the judgment and experience of the one in charge of the tests, and it is not possible to lay down a general rule which may be followed in all cases.

The next quality to be considered in judging a casein is its strength. As already stated, the purpose of the casein is simply to make the clay, or other mineral matter adhere to the paper, so that its strength may be stated as the amount of casein required to make a given amount of clay adhere so firmly to the paper that it would not be removed by ordinary printing processes. By many, the strength of a casein has been considered to be proportional to the thickness of its solution or to the firmness of the so-called jelly formed when the solution is cold. Still, others judge by the length of threads formed when the solution is pressed between the thumb and finger and then pulled apart, that which gives the longest threads being considered the strongest. Many careful comparisons have failed to establish any definite relationship between such tests and the actual amount of casein used in practice, so that a more rational method was desired. The details of such a test, which has been used by the writer for many years with excellent satisfaction, are briefly as follows.

One hundred grams of clay, which has been dried at 100 deg. C., are weighed out into a thick-walled porcelain cup, 70 cc. of water are added and the cup set one side to allow the water to saturate the clay. While this is taking place 50 gms. of casein are weighed into a tarred beaker, 190-200 cc. of water are added, and then the amount of alkali which has been found to give a complete solution is stirred in and the solution completed by heating on a steam bath. If 200 cc. of water, or a little less, are used, the final solution will weigh a little less than 250 gms. and it should then be brought up to this weight by adding hot water, so that each gram of casein is represented by 5 gms. of solution. The clay and water are next thoroughly worked up to a smooth paste by means of a copper rod which has been flattened into spatula form for a distance of about three inches, and which has had the flattened end turned over nearly at right angles to enable it to work out lumps which may settle on the bottom of the cup. The cup, clay and copper spatula are weighed and then enough of the casein solution (30 gms.) poured in to equal 6 gms. dry casein. This is then thoroughly mixed with the clay, and a thin coating applied to a small sheet of paper which is then marked "6" and put one side to dry. The cup and its contents are once more balanced up and 5 gms. more solution added and mixed in; the sheet spread with this is marked "7." This process is repeated till the amount of casein reaches 11 parts for the original 100 parts of clay, and unless the casein shows unmistakable signs of poor manufacture or subsequent deterioration it is seldom necessary to carry it further.

In spreading the sheets for this test a brush may be used, but it has been found more convenient to apply the coating by means of a thin steel scraper, which is made from an old saw and bent into an arc, so that it may be held in the hand and drawn across the paper with its surface nearly parallel to the latter. The edge of this scraper must be ground perfectly true and smoothly polished so that it may not leave scratch-

edges, it should also be as light as possible, otherwise it will be difficult to regulate the amount of coating applied. When using this scraper the paper should be supported by a perfectly flat surface, such as a machined brass plate, so that the coating may be applied uniformly.

When the individual test sheets are thoroughly dried they are inspected and two positions selected on each in which the coating appears of a uniform thickness on looking through it at a strong light. After marking these positions, a short stick of sealing-wax is melted on one end, applied to the paper with a moderately firm pressure and allowed to stay till fully cold. The melting of the wax may be done by means of a gas flame if care is used that it does not burn, but a better way is to make a copper box with a flat top, which can be heated by blowing steam into it, and to stand the pieces of wax on end on this box till they are sufficiently melted to adhere to the paper. When the wax is cold the paper is held down firmly by a finger on either side of the wax and the latter is removed by a steady vertical pull. If insufficient casein has been used the surface of the wax will be covered with a thin film of clay, but no fibre, when enough casein is present, the fibres of the paper will be found adhering to the wax to the very edge, while at the transition point between weak and strong, the wax will show fibres in the centre, but an edge which is bare, except for clay. A characteristic record for a casein of good grade would be about as follows:—

6 gms. per 100 of clay—clay but no fibre adheres to wax; too weak.

7 gms. per 100 of clay—fibre in centre, but clay only on edges; the transition point.

8 gms. per 100 of clay—fibres adhere over full surface; strong enough.

This casein would be said to be strong enough with between 7 and 8 parts per 100 of clay.

In interpreting this test, it must be remembered that it does not mean that in practice 7-8 lbs. of casein will hold 100 lbs. of clay, and give a coating which will peel without peeling, for it is found that owing to the different conditions in coating paper on a large scale, a much larger amount will be required. It has however been repeatedly demonstrated that the strengths as shown in the laboratory tests are directly proportional to the amounts which it is found necessary to use in actual work, so that if one casein tests 8 parts and another 10 parts per 100 of clay in the laboratory, it is perfectly safe to say that the manufacturer of coated paper will have to use more of the latter than of the former to produce the same result. It is on this basis, as a strictly comparative test, that the method justifies itself.

In performing this strength test a number of precautions must be observed, since if they are not, the value of the test, even in a comparative way, is very slight. It has been found that the quality and fineness of the clay used exerts a remarkable influence on the test, so that clay containing more casein than those of coarser texture. This necessitates keeping a supply of clay on hand and before this is gone selecting another sample for comparison with the first so that it may be certain the test gives the same test as the old. This is not always an easy task and it is sometimes necessary to have strength tests with the same sample of a well chosen different samples of clay before the proper supply can be selected. This same method of testing has to be applied to the paper used when

the old supply runs out, only in this case both the casein and clay are the same, and the paper to which they are applied varies. The causes which makes the papers differ in the amount of casein required to hold clay on their surfaces are not entirely known, but some of the contributory causes are variations in sizing, surface finish, and the beating of the fibres. Even with a knowledge of the way in which these factors influence the results it is not always possible to tell what a given sample of paper will do, so that the only satisfactory way is to make a practical trial. Another point to which attention must be paid is the thickness of the coating applied as this has a considerable influence on the wax test. It is often found that the thicker portions of the coating will give a much lower strength than the thin parts on the same sheet, and this is the reason for the careful selection of points of uniform thickness when applying the wax. There are undoubtedly other factors which exert some influence over this test, but these three are the most important, and if the precautions noted above are carefully observed, the test will give concordant results.

It might be argued that a test which is so sensitive in several of its essential elements would be impossible of practical application, but it has been found that the same observer can readily duplicate his results and even that two different observers working in the same laboratory and with the same materials can obtain practical checks. It is, however, quite evident that unless standardized clay and paper are supplied from a central depot and personal instruction given in the method of making the test, the results of different workers will not be the same, though with a given series of caseins there should be a constant difference, i.e., one series of tests should be consistently higher or lower than the other. Lack of consideration of these facts is likely to lead to confusion and differences of opinion, and the test is, on the whole, not one which can be generally applied by both manufacturer and user of casein or which could be included in specifications for quality. It is, however, of great value to the producer of coated paper, and can well be adopted by all who desire to keep their casein consumption at a minimum.

The question of the moisture in commercial caseins has been touched upon in the preceding portion of this paper where it was stated that goods in the American market contained on an average about 9.64 per cent, and that the maximum observed was 12.3 per cent. If much more than this is present the casein is very difficult to grind, as it appears more or less elastic and therefore resists crushing. This tends to set a practical limit to the amount of moisture which can be left on drying a casein and intentional moistening as a means of increasing the weight is probably never practiced because of the danger of its spoiling subsequently. As it is, nevertheless, occasionally desirable to determine the moisture present, it is well to note the possible methods and conditions.

The most common procedure is to dry a sample at 100-105 deg. C., and if this temperature is maintained for 2½ to 3 hours, the weights will be found to be practically constant. A long series of tests showed that different caseins do not behave in exactly the same way on drying, but in general, it may be said that sufficient decomposition of the casein to cause an appreciable error does not occur below 115-120 deg. C., and that exposure to 105 deg. C. for as long as 18-20 hours does not vitiate the results.

Another method which is capable of giving just as accurate results in a shorter time is that of distilling from a flask in which the casein is covered with water-saturated xylol or toluol. The distillate is collected in a graduated vessel, and the water which settles to the bottom may be read of directly in grams.

It is fully realized that the methods of testing described in this paper do not, on the whole, assist materially in drawing up specifications for casein, but they are probably the best which have yet been proposed for use by the manufacturer of coated papers. Since, from the standpoint of both producer and consumer, it seems very desirable to have standard tests, by which it may be accurately graded, it is hoped that this discussion may encourage others to describe similar attempts to solve this problem.

NEW WOODS FOR PAPER FOUND BY U. S. FOREST PRODUCTS LABORATORY.

(Special to Pulp & Paper Magazine.)

New York, N.Y., February 25, 1914.

A recent issue of the New York Herald is printed on paper made from woods which have not been used heretofore for news print paper.

Spruce, abundant in the New England and Lake States and in Canada, has heretofore been the standard wood for making news print paper, and as long as there was a supply sufficient to meet the needs of the paper industry, there was no reason to seek substitutes. But heavy inroads have been made on the spruce forests of the western part of the United States in this day of great circulations and large editions, especially of Sunday papers, with their many parts. On a rough estimate, a newspaper with an average circulation of sixty thousand copies and an average edition of twenty pages, uses each day the product of about four acres of forest. When this figure is multiplied by the great number of newspapers published in the United States, many of them with much larger editions, and when this is further multiplied by 365, because many papers are issued every day of the year, it can be seen that the drain upon the forests is enormous. Foresters say that even under the most approved methods known to their profession, it could scarcely be expected that spruce would be able to hold its own, but would need supplementing by other material.

It is but natural, therefore, that paper manufacturers are looking for new sources of supply which will furnish an abundance of wood pulp at a price which will not be prohibitive. Poplar and a few other woods are used, but they do not go very far.

Forest Service Seeks New Woods.

In the national forests there are many woods considered inferior by lumbermen. Yet they are available for purchase at low rates and many of the timber stands are readily accessible. The forest service, in its desire to utilize to the best advantage all of the resources of the federal timber holdings, has been seeking proper uses for these trees and has experimented in making pulp from them at its pulp laboratory at Wausau, Wisconsin, an auxiliary of the forest products laboratory at Madison. The Wausau laboratory is equipped with standard machinery and all experiments are carried out under conditions which duplicate commercial practice.

As a final test of the value of some of these new woods under practical conditions, arrangements were made between the forest service and the Herald to

print some part of its edition on paper made from various woods that showed promise as substitutes for spruce. These woods were ground at the Wausau laboratory; the product was then mixed with the usual proportion of chemical pulp and made into news print paper, rolls of which were sent to New York for the experimental run.

Need of a Practical Test.

The new woods must fulfill many conditions as to color, finish, and strength. In these trial runs, most of the paper is made from various western firs, which show considerable promise, but the investigators do not consider their tests complete until they have subjected the paper to actual printing conditions. They grow throughout the mountain ranges of the west, particularly in the Pacific Coast States.

In addition to their interest in finding new uses for little-used woods, federal forest officers naturally desire to keep the newsprint paper manufacturing industry within the United States. They therefore seek to present the opportunity offered by many of the woods on the national forests, where there is a supply of cheap wood available for many years to come. Other woods have been tried for pulp by the forest products laboratory and other newspapers will make experimental runs of the paper.

CONDITIONS IN LUMBER CAMPS.

(Special to Pulp & Paper Magazine.)

Ottawa, Ont., Feb. 25. Whether or not the lumber camps of the Ottawa Valley to-day are so operated as to provide sanitary and reasonably comfortable accommodation for the lumberjack is a subject over which a newspaper controversy has been waged in Ottawa during the past two weeks. Lumberjacks who have returned to the city lately have complained that shocking conditions are permitted to exist in the camps, and their statements have in turn been denied by the lumber operators, including all the local lumber and pulp manufacturing firms.

The complaints made by the men are to the effect that they "have to start work at three in the morning, eat a lunch of frozen bread and pork in the center of a lake at mid-day, and return to a sieve-like camp, sometimes after seven o'clock at night, to sleep on hard boards with one and one-half pairs of shoddy blankets," as one of them put it. He told tales of horses with bleeding fetlocks, of insanitary camp conditions, etc. On the other hand, officials of the E. B. Eddy, J. B. Booth and other companies stated that their men were now treated one hundred per cent better than two years ago; that they got good food and were housed in comfortable quarters. As to sanitary conditions, they pointed out that Ontario inspectors periodically visited the camps, and that they were fumigated every two weeks.

ABITIBI PULP CO. ARRANGES FINANCES.

At a special meeting of the shareholders of the Abitibi Pulp & Paper Company, the arrangements for the reorganization of the company announced by the directors was ratified. Mr. F. H. Anson, President of the company, said that the Abitibi Company had closed with a Chicago banking house for the sale of \$3,500,000 securities, and that this would provide ample capital for the present needs of the company.

CANADIAN PULP AND PAPER CONVENTION.

FIRST ANNUAL MEETING.

The first Annual Meeting of the Canadian Pulp and Paper Association was held in Montreal on Feb. 26, at the Windsor Hotel.

The business meeting, in the afternoon, was attend-

some uncertainty existing as to the real intention of the transportation companies.

Regret was voiced that the association included no more than twenty-seven of the sixty or seventy firms in the Dominion. Plans were proposed for a movement to persuade others to affiliate with the body, from which it is expected an increase of membership will result.

Carl Riordan was re-elected president. I. H. Weldon vice-president, with the following members of the executive committee: - C. Howard Smith (Montreal), F. H. Gage (Toronto), G. M. McKee (Quebec), F. H. Ritchie (Toronto), T. J. Stevenson (Montreal), K. L. Warren (Riviere du Loup), H. Crabtree (Crabtree Mills).

In the evening the Association dinner was held at the Windsor. There were but two toasts, those to "The King," and to "Canada," and the only speech delivered was that by the witty and eloquent Col. Hugh Clark, M.P., for Centre Bruce, and editor of the *Kinardine Review*. The chair was occupied by the President, Carl Riordan.

Col. Clark, on rising to reply to the toast "Canada," said that the fact that he was not directly connected with the pulp and paper industry was largely accountable for by his own comparative poverty and the contrast between his own meagre personality and the prosperous and well-nourished appearance of the members of the association. While he could not share their prosperity, he was glad to share their banquet, for though



CARL RIORDAN.

Re-elected President—a broad gauged business man.

The subject was also discussed in a paper by Mr. J. R. K. Bristol. A change such as was advocated, it was pointed out, would assist the manufacturers by a knowledge of wherein they were weak or strong, and what proportion of the imports totalling \$8,900,000 might be offset by them. A close statistical investigation would show why Canada which has the labor, the material and the market, needed to import so fully.

After Mr. Howard Smith had read a paper on Trade Customs, a motion by Messrs. Wallace and Gage, to the effect that the executive be asked to draft trade customs for the trade as a whole, the draft to be submitted to individual firms who shall make their suggestions to be incorporated in general trade customs, was passed. Discussion upon the proposed new car load minimum imposed by the railroads took place, but the matter was left in abeyance for the time being, as the thirty-five members, and a paper was read by Mr. S. S. McPhail, of the Census and Statistics Department.



I. H. WELDON, Vice-President.

a Conservative, he was a firm believer of free food. He felt amply qualified, he said, to address the members of the association, because, knowing absolutely nothing of the pulp and paper industry, he could speak freely and without prejudice. It was a proverbial axiom that individuals of the human race could always enjoy a certain degree of consolation by viewing the plight of others more wretched than themselves, and he

hoped the pulp and paper men present would get a great deal of consolation by looking at him as a wretched victim who, being a newspaper publisher, was compelled to buy their products.

In speaking of Canada's resources, Col. Clark quoted the famous Dr. Johnson's grandiose words at the auction sale of the Thrale brewery: "Gentlemen, it is not vats and kilns you are buying, but the potentialities of wealth beyond the dreams of avarice." In a much larger sense Canada's forest, mineral, agricultural and other resources were potentialities of inexhaustible wealth of which every Canadian should be proud. Col. Clark believed that Canadians of all ranks realized this. After a lengthy political experience in the Ontario Legislature and the Dominion Parliament, he believed that the average man in public life of either political party, was trying to the best of his ability to serve the people and the country faithfully.



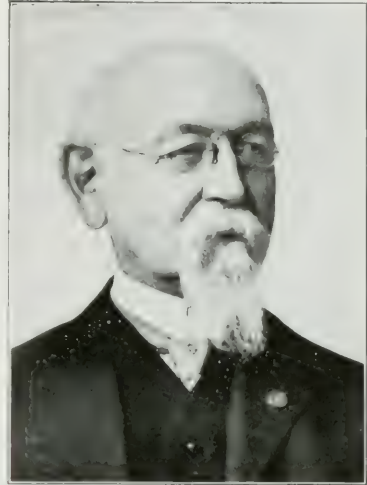
H. T. MELDRUM, Sec'y-Treas.

Canada in the past had been profligate of its great assets, but an era of conservation was now opening. Not the least of Canada's assets were its men, women and children, and the idea of conservation was being extended to include them. A worthy start had been made at the Guelph prison farm, where men who had gone wrong were given a fresh start without being humiliated and disgraced. The new idea in treating delinquents was that every prisoner was not a criminal and every criminal not a prisoner.

Canada's third great asset was her close connection with the Empire. Great Britain had made her mistakes, but she was still, as Lord Rosebery declared, the greatest single secular force for good in the world. So long as Britain retained that distinction, so long would she occupy the position of leading the world, and pass future crises as she had successfully passed great crises in days gone by.

The President, before dismissing his guests, referred briefly to Col. Clark's remarks about the conservation

of human beings, and said that it called to his mind a subject of importance to members of the association, namely the Workman's Compensation bill now under consideration by the Ontario Government. Some em-



GEO. H. MILLEN, Member of Executive.

ployers were fighting the bill vigorously, he said, but the principle that human wear and tear was as much a charge on an industry as the deterioration of machinery was being universally recognized, and the law that Ontario was now considering would ultimately be adopted by other provinces. Mr. Riordan therefore in-



GEO. M. McKEE, New Member of Executive.

ged a careful study of the subject by the members of the association.

On the whole the gathering was a good success for a one year old organization, and bespeaks prosperity for the industry.

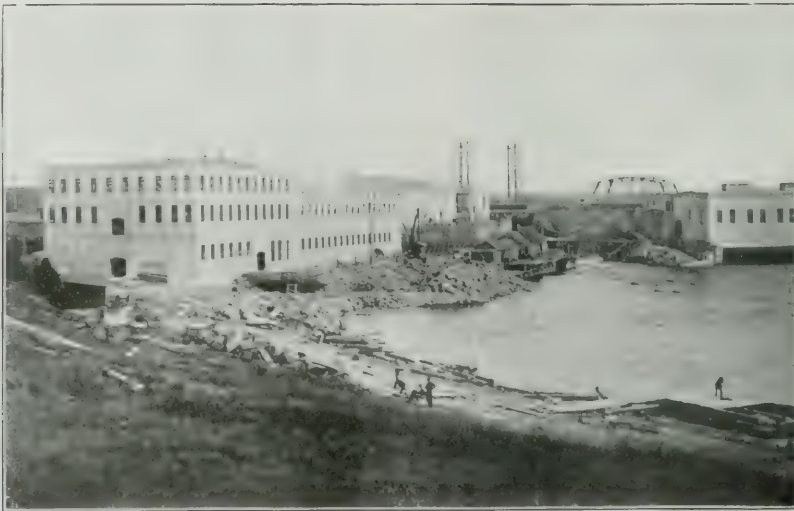
ONTARIO AND MINNESOTA POWER COMPANY

(Special to Pulp & Paper Magazine.)

Toronto, February 24th, 1914.

The two million dollar news print mill, which is being erected at Fort Frances, Ont., by the Ontario and Minnesota Power Co., is rapidly nearing completion, and it is expected that all the equipment will be installed and the plant be in operation early in May next. The mill is one of the most up-to-date and advanced of any on the Continent, and will have a capacity of 120 tons per day from the two 186-inch Fourdrinier machines, which are being installed by the Bagley and Sewall Co., of Watertown, N.Y. The machines are the widest ever built by his firm, and will have a speed of about seven hundred feet per minute.

The power for the new plant as well as that for the paper mill of the company at International Falls, Minn., just across the Rainy river, is obtained at Couchiching Falls where an immense dam and power house have been constructed and 35,000 horse-power of electrical energy is generated. It will be remembered that, after much litigation between the town of Fort Frances and the Minnesota and Ontario Power Co. matters were finally adjusted between the corporation and the company. An agreement was reached to the effect that the latter was to build the large mills on the Canadian side. Work was started in the fall of 1912 and continued with during the past year,



Ontario and Minnesota Power Co. New Plant at International Falls.

About four hundred men will be employed in the mill and camps and the pay roll will be half a million dollars annually. It is rumored in Fort Frances that, when the news print mill is in full operation, that even larger things will be undertaken by the Ontario and Minnesota Power Co., of which E. W. Backus is president and manager, and John J. Ross is general superintendent. The proposition of the company is to erect a large mill to make book and kraft paper and, if the plans are carried out, it will mean the expenditure of another million and a half dollars for buildings and equipment.

The brick work and cement work of the huge walls and foundations was constructed by G. A. Shannon of Chippewa Falls, Wis., and the supervision of the enterprise was under the personal direction of T. D. McArthur, superintendent of construction for the Ontario and Minnesota Power Co. It may be mentioned, in connection, being a former resident of Niagara Falls, that four hundred car loads of building have been shipped for materials in the immense plant.

and Fort Frances is now proud of its paper mills and subsidiary industries, which include the large power house and ground wood plant. The town is a natural gateway for logs, and it is estimated that over two million feet of timber pass each year down the Rainy river into Rainy Lake to Fort Frances, being sluiced through the logway specially built for that purpose.

It is expected that fifty thousand cords of spruce will be required to feed the new ground wood plant and news print mill, and the settlers have thus found a ready and easy market for their pulp wood.

The following is a detailed description of the new mill, and its equipment in the various departments:

Boiler Room—72 feet x 72 feet. One storey high; stone, brick and steel construction. Containing four 400 H.P. boilers.

Pump Room—30 x 72 feet, two stories high; boiler feed pumps, blowers for boilers and smoke stack. Upper floor reserved for wet machines. Building of stone, brick and reinforced concrete.

Machine Room—96 x 256 feet, 6 inches; two stories high. Built of stone, brick, reinforced concrete and steel trusses. Basement 22 feet high, containing suction and stock pumps, beaters and Jordan engines, also 2 500 H.P. steam engines for driving paper machines. Upper floor 34 feet high, containing two 186 inch paper machines; capacity 60 tons each in 24 hours. Each machine has four screens located at wet end.

Finishing Room—109 x 96 feet; three stories. Built of stone, brick, and reinforced concrete, 67 feet high. Basement containing blowers for heating and ventilating mill, also machine and repair shop. First floor is used for finishing paper (wrapping). One top floor will be used for storing paper.

Screen Room—West of machine room—55 x 93 feet; three stories 40 feet high. Built of concrete and reinforced concrete. Basement contains stock chests and pumps. First floor contains screens for ground wood, pulp, decker machines for ground wood, and sulphite.

Wood Room—south of Church Street—48 x 120 feet; one storey, 18 feet high. Contains saws, barkers and conveyors to prepare the wood for grinding room.

The total length of the mill, excepting wood room is 466 feet 6 inches; width, 72 feet, at south end 151 feet, including screen room; 96 feet at machine room and finishing room. Between machine room and Canadian Northern tracks are switching tracks and track with platform for loading finished paper.

PAPER PAIRS AND CHEESE BOXES NEW WISCONSIN PRODUCT.

Paper pairs for shipment of candy, tobacco and other things of the kind usually sent in wooden pairs, and paper cheese boxes to take the place of the expensive, destructible and cumbersome wooden cheese boxes are the latest things added to the list of Fox River Valley made goods. The paper pairs are being made at the plant of the Strange Paper Company, at Menasha, and the paper cheese boxes are being manufactured at the plant of the Menasha Carton Company.

The idea of substituting paper for wood in the matter of cheese containers was conceived by the Menasha people last summer. It looked so good to them that they immediately caused to be made several thousand of them, and asked certain extensive dealers in cheese to try them in place of the wooden boxes, to determine their serviceability for the purpose. They have proven eminently successful. In fact, it is no rash prediction to say that the days of the wooden cheese box are numbered. The paper boxes are equally if not more durable; they are lighter and equal to any test the wooden box is put to. They are all that and cheaper. The reports of those who have used them have been so encouraging, in fact flattering, that the Menasha Carton Company has decided to install enough new machinery to make possible a daily output of paper cheese boxes of four thousand.

THE GREAT LABOR CONFLICT AVERTED IN NORWAY.

Notices have been given out from the Norwegian Employers' Association of a lockout comprising the iron workers, wood pulp and paper workers, and wood workers. At the same time the central organization of the laborers declared sympathetic strike comprising all work on the exposition at Christiania, all printers in the country, sailors and firemen on coasting steamers, bakers in the larger cities, and a few minor trades. Both notices were to take effect on February 19.

The mediator, Mr. Heftye, and representatives for the employers and laborers were in session all night, but an agreement was reached, by which the great conflict will in all probability be averted. This agreement will be placed before the boards of the two organizations Saturday and it is considered certain that it will be approved.

MR. HASTINGS HEAD OF U.S. EXPORT ASS'N.

(Special to Pulp & Paper Magazine.)

New York, N.Y., February 25, 1914.

The United States Paper Export Association, which have offices in the Whitehall Building, 17 Battery Place, this city, recently increased its capital from \$25,000 to \$100,000 in order to expand its field. New members have been taken into the organization, and a much wider field will be developed in the near future, as more lines will be added.

The Association has elected Arthur C. Hastings, who has been for several years president of the American Paper and Pulp Association, as the executive head. The other officers are: Louis Chable, of the International Paper Company, vice-president, and D. F. McIntosh, secretary and treasurer. The directorate of the organization comprises these three men, together with B. A. Franklin, president of the Strathmore Paper Company.

OCEAN FALLS CO.

Persistent efforts are being made to close out the business of the Ocean Falls Co., Limited, as intimated at various intervals of late. Now the order of the Supreme Court to dispose of the assets as a going concern, is to be carried out. An auction sale was advertised for the 23rd prox in Vancouver. The assets consist of a most modern sawmill with a capacity of 250,000 feet per day, pulp mill, power plant of 11,000 horse-power, fully equipped logging and marine camp, townsite comprising hotel, general store, dwellings, wireless station, dwellings, wharves, warehouses, etc., 402 acres of land and valuable pulp lands and water rights.

RAINBOTH vs. O'BRIEN.

(Special to Pulp & Paper Magazine.)

Athens, Feb. 26. — Valuable timber and pulpwood limits in Pontiac County worth \$2,000,000, were involved in a \$500,000 judgment given to Mr. R. Rainboth of Aylmer, Que., last week in the Superior Court at Bryson, Que., against Mr. J. O'Brien of Renfrew. Mr. Rainboth sought to obtain a quarter interest in certain timber limits in Pontiac County on the line of the Transcontinental Railway, through a contract which he entered into with the defendant, Mr. O'Brien, whereby Rainboth was to get a quarter interest in the timber limits which O'Brien desired to purchase, providing he could buy them for a certain figure. The limits were twice put up for auction, but there were no bidders at upset price, and they were afterwards disposed of at a private sale. The defendant bought in the limits, which were pledged to the Merchants Bank at \$750,000, and a sum amounting to \$42,000 was paid out in expenses for Crown dues, etc. Seeing that the limits were pledged to the bank, which had power to dispose of them, it was held by the Court that O'Brien had parted possession with the limits, which are now valued at \$2,000,000, and Mr. Rainboth was given judgment for \$500,000 less his share of the \$42,000 expenses incurred.

NEW MITSCHERLICH SULPHITE MILL.

As intimated about a year ago, in the Pulp & Paper Magazine, the Bathurst Lumber Company of Bathurst, N.B., were contemplating building a pulp and paper mill. These plans have now come to a final head, and they propose to build a fifty-ton sulphite mill the coming season to manufacture the highest grade long cook bleached mitscherlich sulphite fibre. The pulp and paper mills will be operated under the name of the Bathurst Pulp & Paper Co., Ltd. Mr. Angus McLean is the general manager of the Bathurst Lumber Company, and has been instrumental in bringing their



ANGUS McLEAN,

Gen. Mgr. Bathurst Lumber Co., who will build new pulp and paper mills.

plans to a final successful conclusion. The manager of the new mills will be A. G. McIntyre, Editor of the Pulp & Paper Magazine and Superintendent of the Forest Product Laboratories. The mill will be in operation on May 1st, 1915.

The demand for this class of pulp in Canada is very large and, at the present time, high grade paper makers are unable to buy in the Canadian market pulp of this quality of domestic production. The Bathurst people propose to make thirty-six hour cook sulphite and bleached electrolytically. The proposed location of the mill has a decided advantage over most paper mill locations in Canada. It is on tide water, has rail connection and good labor market. They will be able to obtain a cheap supply of coal, sulphur and salt, and will consequently have a very low manufacturing cost. The mill is to be situated on the shores of Bathurst Harbor on the edge of the town, and has tributary to it the Nepisiguit and Tobique rivers, and the limits owned by those people on the north shore of Bay Chaleur. The Bathurst Lumber Company owns 2,800 square miles of timber lands immediately tributary to the mill and they propose to manufacture only the very highest grade of pulp. Paper mills will later be added for the manufacture of news print, a board mill for the manufacture of board, and many kinds of specialties.

NEW PRINTING BUREAU.

(Special to Pulp & Paper Magazine.)

Ottawa, Feb. 26.—Considerable interest has been taken by the Canadian paper trade in the announcement made by the Secretary of State in Parliament last week that the supplementary estimates would contain an appropriation for plans for a new printing bureau for Canada. This will replace the present bureau, which has for years been inadequate to the demands on it. Situated in Major Hill Park, it is an old structure which is now taxed to the limit of its capacity. As a result of its inadequacy, a very large proportion of Government printing has been given to outside firms, which means that the immense quantities of paper used in turning out various official publications, has been furnished by these latter. With the new bureau, which will be built large enough to turn out practically all the Government work, printing, bookbinding, etc., the Government's requirements for paper will be greatly increased and some change in the method of obtaining it may be necessary. At present it is obtained by contract instead of public tender.



A. G. McINTYRE,

Manager of new pulp and paper mills of the Bathurst Lumber Co.

BRITISH FIRM GETS PAPER MACHINE CONTRACT.

The Belgo-Canadian Pulp & Paper Co. Ltd., at Shawinigan Falls, P.Q., have placed the contract for their new large paper-making machine with the well known British engineering firm of Chas. Wainman & Co., Ltd., through their Canadian Agents, C. H. Johnson & Sons, Ltd.

We are informed that this machine will be 202 in. in width, and is guaranteed to run at a very high speed.

American Pulp and Paper Association.

(Special to Pulp & Paper Magazine.)

New York, N.Y., February 19, 1914.

The thirty-seventh Annual meeting of the American Paper and Pulp Association was held at the Waldorf Astoria Hotel, yesterday and to-day. Wednesday was devoted to division meetings and what changes in trade customs or suggestions were decided upon, were put before the general meeting to-day.

There were six divisions which made no report to the president this year. They were: Coated Paper, Blotting, Cover Paper, Chemical Pulp, Ground Wood, and Glazed and Fancy Paper. Another report that was lacking this year was that of the Chemists, which was due from Arthur D. Little.

There was little new business taken up by most divisions. One change of rather great importance was proposed in a change in the by-laws of the wrapping division. This body has elected a tentative organization as follows: Frank L. Moore, chairman of the Wrapping Paper Division; Executive Committee: L. M. Alexander, of Wisconsin; George C. Bayliss, of Pennsylvania; M. E. Marcuse, of Virginia; S. A. Upham, of New York, and George E. Crafts, of Maine. This committee is at present in authority, but the general meeting did not ratify the change, as the matter was laid over until the first meeting of the executive council of the association, which is composed of C. A. Babcock, Frank L. Moore, Thomas Hunter, C. A. Crocker, E. C. Robertson, F. S. Harrison, E. A. Morrill, Jr., and B. C. Hill. The committee on by-laws, chosen by the wrapping division comprises: W. B. Van Allen of New York; George Sisson, of New York; and Louis Block, of Oregon. The parent body of the tentative organization is made up of Frank L. Moore, L. M. Alexander and M. E. Marcuse.

All present officers of the Association will hold over in their present capacities until the next meeting of the Executive Council, which will nominate the new heads. No election at all was held to-day. President Arthur C. Hastings will not consider a renomination under any circumstances. He has been elected President of the United States Paper Export Association, and it was reported, also considered for the presidency and general management of the Remington-Martin Company of Watertown, N.J. The name of Frank L. Moore, president of the Newton-Falls Paper Company, was mentioned and generally discussed as the next candidate for president of the association. Mr. Moore, however, was emphatic in his statements to the effect that he could not, and would not, consider such a nomination.

The remainder of to-day was devoted to a luncheon, in the Myrtle Room, and to routine matters in the general session. Addresses and discussions on topics of interest to the industry were held in the afternoon. The association decided to have a committee appointed to investigate the "Five Brother Bill," which is now before the House Committee on Interstate and Foreign Commerce. The bill is reported to be related to trusts and commercial combinations. No resolutions, however, was passed regarding the tentative legislation.

In the acceptance of the report of the committee on resolutions, the association placed itself on record as opposing the proposal now pending before Congress, regarding an increase in the postal rates of second-class matter. Another bill to which the association is op-

posed is that known as the Campbell Bill, and requires the printing or marking of all articles manufactured, and their certificates as to their processes.

In his annual report at the general session this morning, President Hastings said:—

The President's Address.

The president, Arthur C. Hastings, in his annual address said:

This association is now holding its thirty-seventh annual meeting. We have grown from a few mills, which, in 1878, represented an industry producing a few hundred tons of paper per day, to the present output of something like 15,000 tons daily of the various grades of paper and board, and from an annual business of \$55,000,000, to, according to the United States Census, over \$275,000,000, or twenty-first in importance among the industries of this country.

Prices.—Our members are fully aware that this association is not for fixing prices or restricting product, but that it is entirely educational, with the sincere hope that prices will become more uniform through know-



ARTHUR C. HASTINGS.

President of American Paper and Pulp Association,
Now Head of the U.S. Export Association.

ledge of facts, and that the production will somewhere near equal the demand, due to the facts being developed by our statistics; also that our efforts have been consistently towards developing cost systems and developing conditions, through efficiency methods, that not only result in a benefit to the manufacturer, but to the consumer, as well.

Tariff.—The tariff, which has been settled for the immediate future, is very inconsiderate of some classes of paper and pulp, and fair on others, in view of the reductions made on some commodities.

On those papers where the duty has been altogether taken off, or reduced to a very small percentage, the expected has occurred; the importations have increased enormously, and to such an extent that the home mills have been unable to run full time, or have, run as an unprofitable proposition. Changes have been made from one quality to another in some mills; some failures have resulted through the inability of mills to sell at a profit; mills that have been burned have not been rebuilt, due to the unsatisfactory condition of

business, and water powers have been harnessed electrically, and put into general commercial business, rather than using the power for making paper. These changes are constantly going on in an unprofitable business, and have resulted in injury to the protected mills. It is a question whether it would not have been better for the consumer to have left things as they were, rather than to have brought about a general disorganization. The pro and con of the tariff resolves itself into President Lincoln's remarks on this subject:

"I do not know much about the tariff, but I know this much, when we buy manufactured goods abroad we get the goods and the foreigner gets the money. When we buy the manufactured goods at home we get both the goods and the money."

And conditions have not changed since this speech was made.

A most remarkable result seems to have been brought about by the tariff, if we can believe the reports of the different publications. In Trenton, N.J., daily papers are raising their selling price one hundred per cent, charging two cents a copy, instead of one cent

and as an excuse they give the "high cost of paper." Subscription rates have been advanced by metropolitan papers, and by some 1,100 country "weeklies." One large publisher in Boston, Mass., has reduced his price from two cents to one cent, made possible, he says, by the cost of paper, due to the tariff reduction. In Minneapolis, Minn., an editorial in one of the prominent papers says that paper costs them more, in spite of the reduction in the tariff, so they gave that as an argument as to why the tariff should not be lowered or taken off. In Montreal, Canada, a prominent publisher states that he became interested in various papers with a view of standardizing widths used, so he can buy more paper, and thereby get it cheaper. Now any one of these arguments can be taken for what it is worth, and they quite compare with arguments that have been brought before the Congress and various committees, from time to time by the consumer.

Now that the publishers are complaining to the Attorney General of the United States, as to the "trust" methods of their competitors, we may console ourselves with that old "saw," which ran something like this: "When thieves fall out, honest men may get their due."

In a preliminary statement by Secretary Redfield, of the Department of Commerce, in Washington, dated February 11, 1914, the following appears:

"It will be apparent that the new tariff has not thus far resulted in any material increase of importations of manufactured articles to compete with the products of our own factories, but rather that its important effect has been to add to our food supply in such a way as either to prevent additions to prices already high or else to reduce them. This condition shows again if December of 1913 is compared with December of 1912."

Imports.—This comparison shows that for the month of December, 1913, we imported "manufactures ready for consumption," \$5,000,000 more than in 1912. Of this, \$5,000,000 increase, under the heading "paper and manufactures of," we have contributed 15 per cent, which hardly seems fair.

Depreciation.—It has always seemed to me that we are not treating our business in as serious a way as we should. I take it a man stays in the business for no other reason than for a profit, or because he cannot get out of it. A profit is merely the difference between the cost and selling price, and where many manufacturers decrease themselves in the cost. There is one

large item over and above the cost of material, labor, etc., that must be reckoned with, but very seldom is; that is, depreciation—not only on the machinery and buildings, but what is going on all the time, unforeseen—the depreciation of a mill, due to the building of new mills, which have modern machinery, producing, probably, at a less figure than the old, which must reduce the value of the old mill. I venture to say that very few mills have done justice to themselves in depreciating their plants from year to year. The result of proper bookkeeping would show a loss, and as no man likes to face that showing, the result should be a tendency to raise the price to show a little credit balance.

Profit. In some countries the Government insists upon a fair profit being made by corporations, and objects, on the other hand, to excess gain. Our Government, on the other hand, seems to take a different view of the manufacturers' rights.

Trade Customs.—Trade customs should be freely discussed, and after adopted, firmly adhered to. No one practice demoralizes trade and prices more than unintelligent marketing. Lowering prices to get an order is not nearly as disastrous as lowering the standard of trade dealings. A recovery from the first fault can be immediate, but the latter is very slow.

Labor Conditions.—Labor conditions in the paper business, so far as we are advised, are in a normal condition. I believe our employees realize the unprofitable condition of the paper business, as a whole, and have not been unreasonable in their demands. There is no question but that the conditions as to hours of labor will be more uniform all over the United States than they are at present.

Water Power.—Water power conditions in the last twelve months have been rather unusually good. In fact in some quarters there has been too much water, and, under the law of average, we may expect different conditions during 1914.

Export.—Exporting, as applying to the paper business, is a very important branch of the business that should be looked into and nursed by the American manufacturers. From our investigations we find that the trade of the world in paper is constantly increasing; that there are comparatively few countries that export paper; that there are a great many countries that do not manufacture paper, and, are, therefore, buyers. We have not held our position in this respect with other paper making nations, and it must be largely due to our not taking the matter up vigorously and intelligently. The advantage of paper sold to other countries is two-fold, and any legitimate means of increasing exports in any grade of paper from this country should have the fullest co-operation of all manufacturers.

Statistics.—The value of statistics is recognized in every large industry, and one has only to note the daily papers from day to day to see reports of business conditions in the various industries as reflected by comparative conditions in their respective lines; and so a careful manufacturer of paper and pulp can watch market conditions by our reports, and gauge his conditions as to manufacturing and marketing by his only perfect guide—"supply and demand."

Reports and Membership.—We had in 1908 some 224 mills reporting, and to-day we have 352. Our membership has grown in the same time from 100 to 267. There has been a falling off in the membership due to one of the large sections deeming it advisable to segregate their industry from the general paper business, due to some conditions which are peculiar, they claim,

UNITED STATES NOTES

(Special to Pulp & Paper Magazine.)

One of the few representatives of shippers to appear before the Inter-State Commerce Commission in Washington on February 15 with no protest against the proposed 5 per cent freight advance which the Eastern Roads desire to make was: James L. O'Brien, representing the paper companies in Sault Ste. Marie and Sturgeon Falls, Ont., and Chillicothe O. The shippers, Mr. O'Brien said, did not object to the increase, and were willing to abide by the judgment of the Commission. C. H. Tiffany, of Boston, traffic manager of the Pulp and Paper Association of New England, declared that the protest of his clients was not against the proposed increase as such, but against the relative adjustment of rates, which gave shippers of paper and pulp in other sections of the country an advantage over those in his territory.

* * * *

In a letter to the Collector of the Port of New York, dated February 17, Assistant Secretary of the Treasury Hamlin ruled as follows on the proper classification of wrapping paper:—“(1) The provision in paragraph 326 for ‘wrapping paper not specially provided for’ is a more specific designation than that for ‘all other paper with coated surface or surface not specially provided for.’ Wrapping paper with coated surfaces, surfaces rate, therefore, dutiable at the centum ad valorem under paragraph 326, centum ad valorem under paragraph 326. (2) As the provision in paragraph 324 for ‘cloth-lined or reinforced papers’ is without qualification, reinforced or cloth-lined wrapping papers are dutiable at the rate of 35 per centum ad valorem rather than under paragraph 326. (3) Paragraph 324 provides for ‘grease-proof and imitation parchment papers which have been supercalendered and rendered transparent or partially so, by whatever name known’ and ‘all other grease-proof and imitation parchment papers, not specially provided for in this section, by whatever name known’. In view of the specific provision cited for the classification of papers of this kind, by whatever name known, oiled wrapping papers and imitation parchment wrapping papers are also dutiable at the rate of 35 per centum ad valorem under paragraph 324. (4) The waterproof wrapping papers represented by the samples submitted, not being of the character described in paragraph 325 are properly dutiable under paragraph 326 at the rate of 25 per centum ad valorem.”

* * * *

The log cut in the State of Maine will be about 171,300,000 feet this winter, conditions having been favorable nearly all the time since cutting began last fall. Hauling to the landings is now progressing rapidly, and it is expected that every stick cut will reach the drying yards. Estimates of the extent of operations are now being made, and the East branch cut is placed at 4,000,000 feet. The Katahdin Pulp & Paper Co. has taken out 6,000,000 feet of pulp logs, and there are some other operations. On the West branch of the Penobscot, the saw logs amounted to 22,000,000 feet, with the Great Northern Paper Company will have 57,300,000 feet. The Great Northern's Kennebec River

cut is about 15,000,000. On the other waters the operations include about 26,000,000 feet.

* * * *

A fire that caused a property loss of about \$10,000 occurred on the night of February 16 at the Lincoln mill of the Fox River Paper Company at Appleton, Wis. The damage done to the stock at the mill, caused chiefly by water is estimated at about the same as the property loss.

* * * *

The Colonial Paper Company of Mechanic Falls, Me., is now is now busily engaged in supplying the U.S. Government with Lanston monotype key-board and casting machine paper. This company was the successful bidder on this paper last month, when the Public Printer called for supplies for furnishing the Government with paper for 1914. The contracts calls for 63,000 pounds at 6.5c per lb. The price paid last year for the same amount was 6.25c per pound.

* * * *

Liabilities amounting to more than \$4,300,000 are listed in a petition in bankruptcy filed several weeks ago in Utica, N.Y., by John Hunter, the well known Fulton manufacturer. It is said, however, that the figures make the failure appear greater than it really is. The principal Hunter industries, the Hunter Arms Company, The Battle Island Paper Company, and the Hunter Fan and Motor Co., have been operating for several months by a creditor's committee.

* * * *

Joseph W. McDowell, an employee of the Pusey & Jones Company of Wilmington, Del., sailed several weeks ago for Lyoa, Siberia, where he will superintend the building of a paper machine there. Mr. McDowell is employed by the company as an erecting engineer, and some time ago erected a machine in Mexico for the same company. He is expected to be in Siberia about seven months. The plant where the machine is being erected is the Nicola-Pavda Company, and the machine is of the Ford Denier type.

* * * *

In discussing business conditions in the paper industry with a representative of the press, Alexander R. Curre, of the George Irish Paper Co., Buffalo, N.Y., says:—“Business looks a great deal better this month than it did in January. It is very reassuring. We will have a pretty fair Spring opening, and I believe it will get better right along. I base my belief largely upon outside information when it comes to the general outlook. I am in a position here to talk to travelling men from all over the country. I was talking to a Michigan mill man the other day, and he told me that conditions were very good in that State and a letter from Wisconsin was similarly reassuring. Business is going to be better, too. I feel very sure of that. With the first sign of Spring, I think general conditions are due for an instant stimulus.”

* * * *

Cornell & Ward have ordered four large machines for their factories at Kaukauna and in the East. These machines will be used in the manufacture of sanitary

paper towels. They are being made by the Kaukauna Machine Works.

All officers and directors of the Wolf River Paper & Fibre Company at Shawano, Wis., have been re-elected for the ensuing year. Last year the company doubled its capacity in the paper mill and this year expects to double the capacity in the sulphite mill. They can now make sixteen tons of sulphite a day, but this will be increased to 32. This will mean considerable new machinery, a larger building and a good deal of work during the coming season.

Beer mats made of pulp are not to be regarded as "printed matter," according to a decision of the Board of United States General Appraisers. The mats in question were imported at St. Louis by Wilfred Schade & Co., and were returned for duty by the Surveyor at the rate of 35 per cent ad valorem under Paragraph 447, Tariff Act of 1909. The importers said that duty should be levied at 25 per cent under the provision of the law regarding printed matter, on the ground that on the mats was printed matter in the form of an advertisement.

The United States Treasury Department is getting ready to loosen up to paper manufacturers through out the country under claims for drawbacks on importations of wood pulp under the "favored nations" clause of the tariff regulations. It is said that over half a million dollars will be distributed in New England as soon as claims now pending are all proved. Word to this effect has been received by Congressman Treadway from Assistant Secretary Hamlin of the Treasury Department, and it is good news to those paper manufacturers who have put in claims for drawbacks.

PULP AND PAPER REFUND.

The Board of United States general appraisers has decided that pulp wood and newsprint paper produced from wood cut on Crown Lands in the Province of Quebec was not assessed by the Dominion Government with countervailing duty when exported to this country, and that, accordingly, free entry should have been granted when imported here under the Canadian Reciprocity Act of July 2, 1911.

The action of the collectors of customs at Detroit, Buffalo, Burlington, Plattsburg and Port Huron, in exacting duty was reversed. The importers included the Laurentide Paper Company, Limited, William A. Bird, the Central Vermont Railway Company and others. A somewhat similar claim was made by the News Pulp and Paper Company, but over-ruled for lack of evidence.

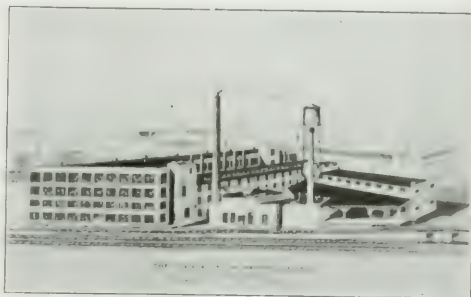
Fred Farnum, ground wood superintendent for Price Bros., has left and returned to Rumford Falls, Me.

W. R. Davis, who has been in the paper line for some years in Calgary under the name of the W. R. Davis Co. The large building in that city, formerly occupied by the Cockshutt Plow Co., has been leased for a term of years and a representative stock will be carried.

Hinde and Dauch Paper Co.

The Hinde and Dauch Paper Co. of Canada now have their new board mill in Toronto in full operation, and things are working smoothly, the output being forty tons per day of jute, chip, filled and other kinds of board. The plant is modern in every detail and about half of the new product is being placed on the market for distribution, while the other half is used by the company in their corrugated paper box factory, the capacity of which has been doubled by the recent extensions. Container board specialties will also be turned out at an early date. The new board mill and equipment cost over a quarter of a million dollars, and the entire plant and buildings of the company on Hanna Avenue, Toronto, represents an investment of about three hundred and fifty thousand dollars.

The Hinde & Dauch Paper Co. of Canada, Ltd., who are manufacturers of corrugated paper specialties, commenced business in Toronto, in January, 1910. They located at Dovecourt Road and Sudbury Street, in a building with a floor space of 50 x 50 feet, owned by the Dominion Glass Co., Limited. A few months later, they purchased from Geo. H. Hees, Son & Co., Limited, their property and two buildings located on



New Mill, Toronto—Hinde and Dauch Paper Co.

Hanna Ave., and moved into same the latter part of August of the same year.

The business increased very rapidly, and soon outgrew these premises. It was found necessary to secure additional manufacturing space for the box factory, and they therefore decided to erect a new building which could be utilized for the manufacturing of board and also corrugated boxes.

They started the erection of the new structure November 1912, and completed the same on December 1st, 1913. This building, of brick, steel and concrete, is 264 feet long and 60 feet wide, four storeys high. The two upper floors are utilized for the manufacturing of corrugated boxes, and are equipped with all up-to-date machinery to fully complete the work. The extension also maintains a complete printing outfit, consisting of two large rotary printing machines.

The board mill has a capacity of 40 tons per day, and is equipped with six 1,200 lb beaters, and screens, manufactured by The Watrous Engine Works, Brantford, Ont., four 20-ton Jordan Engines, manufactured by Messrs. Noble & Wood Co., Hoosick Falls, N.Y., and cutters which were made by the Seybold Machine Co. of Dayton, Ohio.

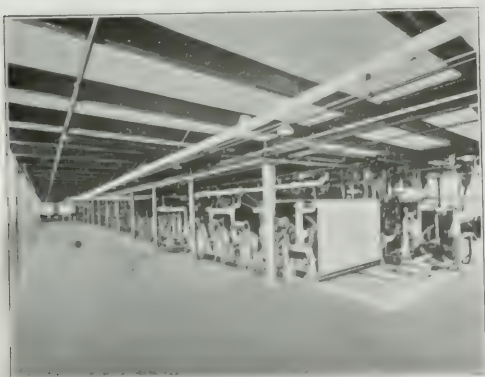
The machine is a 124 in. machine, built by The Downingtown Mfg. Co., East Downingtown, Pa. It has four cylinders, three sets of press rolls, two stacks of calendars, and a Millsbaugh suction roll. There are forty-four, 48-inch dryers on the machine. The steam engines were furnished by The Goldie-McCulloch Co., Galt, Ont., and the motors and generators by The Canadian Crocker-Wheeler Co., St. Catharines, Ont., and



Beater Room—Hinde and Dauch Paper Co.

The boiler plant is complete in every respect, and equipped with three 150 h.p. Canada Foundry Company's boilers.

The beaters are driven by a three hundred horse-power electric motor, and each of the four Jordans by a sixty horse-power motor, while scattered throughout the extensive plant are thirty-two motors from five to twenty-five horse-power for running the box board equipment and the rotary presses in the printing department. All the floors are concrete and the structure is fireproof throughout. The beaters are located on the second floor, the Jordans and board machine being on the first floor. The general offices are also on the second floor, and were laid out, as well as all the



Machine Room—Hinde and Dauch Paper Co.

other departments, including the mechanical installation complete, by Oeyille H. Moore, general manager of the company, who has been in charge ever since the branch was established in Canada four years ago. Mr. Moore is the proprietor of the Moore and Adison stock services which are widely known in the trade and also holds a number of patents on paper making and box board making machines. He has had a thor-

ough and wide experience in all grades of paper, pulp and sulphite products, and during his twenty-five years' connection with the industry has been with the Glenn Falls Paper Co., of Glenn Falls, N.Y., the Dexter Sulphite Pulp and Paper Co. of Dexter, N.Y., and the Hinde and Dauch Co. in their various plants on the other side of the line. Mr. Moore is yet a young man, being on the sunny side of forty, but he has made a splendid reputation for himself as an inventor and manager.

George Brown, late of the Booth board mill, Ottawa, who has also had a wide experience in the trade, is the superintendent. The new industry is a credit to the company, and is one of the few large enterprises in the paper line carried out in Canada during the past year.

The company are able to turn out all grades of box boards, and pasted boards, and also all styles of corrugated shipping cases. The large plant places them in a position to take care of all orders promptly.

SOME USES FOR WASTE SAWDUST.

Sweeping compounds are largely composed of sawdust and silicious material, together with some such binding medium as rosin, tar or some of the crude oils in the market. The idea is to impregnate the sawdust with some cheap mineral oils that oxidize but little and keep moist for a long time. Aqueous oils are also considerably used, as they mix readily with water. If too little fluid or oil is used, the sawdust will not be given its highest absorbent efficiency, and if too much is used, oil or fat stains are likely to show on the swept surface.

The following formula will give an idea of the ingredients and processes necessary for making a sweeping compound: Melt 2 ounces of paraffin wax in 2 quarts of paraffin oil over a water bath; add 6 ounces coarse salt, 5 pounds of white sand, 10 pounds of pine sawdust and 1 ounce oil of eucalyptus—the latter is merely to give a pleasant odour. Mix thoroughly and knead until every particle shows moisture. Heap and leave over night, so the oil may soak into the fibre and spread evenly. This formula would probably prove much more profitable if a cheaper oil were substituted for the paraffin, and it is merely given to show proportions. Such a compound is packed in boxes and retailed by grocers at 10 cents for the 1 pound size and 25 cents for 3 pound packages.

The grocery stores also handle the fire-kindlers, which are largely composed of sawdust. In certain localities, where gas is not used, there is a considerable market for these. Ordinarily they are made by melting 6 pounds of resin in 2 quarts of tar. Cool slowly, and, when quite cool, mix with as much coarse sawdust as can be worked in with a little powdered charcoal added. Spread on boards or specially constructed frames until set, then cut into blocks one inch square. These blocks are retailed by the dozen and burn with a blaze strong enough to light any kind of a fire.

Sawdust is being used to a considerable and growing extent in many machine shops as a substitute for cotton waste. It has been used with cement to make a concrete floor into which nails may be driven. A floor of this kind in the public library of Springfield, Mass., is said to be a success. Reports from Hamburg, Germany, state that sawdust mixed with magnesium chloride is used there extensively for floors in the larger commercial buildings, where it is said to be popular because of its cheapness and partly fireproof qualities. — Wood Worker.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

London, February 16, 1914.

The largest contract for paper ever obtained in the British trade is believed to be that given out by the Encyclopædia Britannica Co., Ltd., publishers of the Encyclopædia Britannica, to Messrs. L. S. Dixon & Co., paper agents, Liverpool. Originally the order was obtained by Mr. Sheldon Leicester (Messrs. Dixon's former traveller), and the sum payable under the contract was about \$139,200. After the contract had been exploited to a certain extent, and many hundreds of tons of Indian paper had been delivered, upon which Mr. Leicester received his commission, differences arose between Messrs. Dixon and the Encyclopædia Britannica Co., Ltd., the latter declining to accept any more paper, as it was not up to the contract standard at least, it was alleged it was not. The question, therefore, arose whether the traveller, who having got the order, was entitled to commission upon the paper invoiced to the Encyclopædia Britannica Co., Ltd. Twelve months ago Judge Darling decided that under an agreement of 1907 between Messrs. Dixon and Mr. Leicester, the latter gentleman was not entitled to his commission, which was in or about \$1,440. From that decision Mr. Leicester has appealed and the High Court of Appeal has upheld the decision of Judge Darling. The case all through has been fought with remarkable ability, and it transpired that legal proceedings threatened between Messrs. Dixon and the Encyclopædia Britannica Co., Ltd., in which there was a claim for \$139,200 and a counter claim for \$662,400, have been completely drawn from the courts. Prior to the proceedings being withdrawn a lot of evidence was taken *à l'Américain* on commission.

The cotton blanket now familiar amongst the working-class people has somewhat of a rival in a paper blanket. The "Journal of the Royal Society of Arts" points out that "the process of taking from the body of the fabric to add to the surfaces one manifestly carried on until no thread structure is left, and in some directions the raising of the surface in order to produce a fleecy fullness has defeated itself. Thus, in the North of England there is a quite inconsiderable sale of the highly raised blankets, which commands all purses in the south. The housewife wants "cloth" blank as to her money, being persuaded, that these unsized and only lightly-raised blankets wear better than the spongy sort." The conclusion, adds the journal, is the outcome apparently of attempts to raise the initial pile upon blankets of no great initial substance. The new product of the paper machine, the paper blanket is made with unsized wood-pulp, crinkled like tissue paper sometimes used for decorative objects and printed with colored stripes in imitation of the "headings" of the regular article.

Through the kindness of the Society of Dyers and Colorists, Mr. Clayton Beadle—the joint production of himself and Dr. Henry P. Stevens—read papers on "The Effects of Mineral Loading upon The Physical Qualities of Hedychium Paper" and "Tests to Determine the Relative Strength of Some Natural Fibres."

Hedychium, as is well known, is indigenous to Brazil and four tons of pulp per acre per annum can be obtained from it. Dealing with the question of loading, Mr. Beadle said that beyond a certain percentage of loading, the mineral had a tendency to displace the fibres as opposed to filling up the interstices between them. When it reached such a point a weakening tendency set in. The Hedychium mineral-loaded papers showed high elasticity up to about 30 per cent of loading, and the experiments showed that the influence of different proportions of mineral matter in combination was very complex and deserved further study. Concluding a highly technical paper on "The Elasticity of some Natural Fibres," Mr. Beadle pointed out that if paper could be made to assume the strength of the fibre bundles from which it was prepared, then the paper yarn industry would be enormously benefited, especially if a correspondingly high wet strength could be obtained, but that was too much to be hoped for, although a great deal might be done in that direction. Such an accomplishment would lift the paper yarn products above the sphere of jute, although the application of the solution would in any case be limited on account of its nature and color, quite apart from its physical qualities.

The Kollins Paragon Paper Pulp Co., announce that the £250,000 four-and-a-half per cent first mortgage Debentures become due on April 1st next, and now offer to the holders of the existing four-and-a-half per cent Debentures the opportunity of exchanging, free of expense, in whole or in part, the Debentures they now hold for the four per cent Mortgage Debenture stock on the following terms: The company will allot to each Debenture holder accepting this offer in respect of each £100 Debentures so exchanged £100 of the new Debenture stock, and will pay to him the sum of £5 on each Debenture in addition to the interest accruing on each Debenture up to April 1st next. The stock now offered will rank equally in every respect with the existing four per cent Mortgage Debenture stock. The total amount of this stock is limited to £250,000 and the stock will constitute a first floating charge on the entire assets of the company. The exchange will take place as from the 1st April next, and the entire sum to be given of the dates when the present Debentures stand to be sent in for exchange. Any four and-a-half per cent Debentures not so exchanged will be paid off at par on April 1st with accrued interest to that date. The conversion scheme now announced was contemplated in 1908.

The adverse trade conditions during the latter part of 1913 were felt by the East Lancashire Paper Co., of Radcliffe, a mill which has not made quite as much profit last year as it did in the two immediately preceding years, but it is still able to pay 15 per cent on both the ordinary and the preference shares, and make the balance forward £6,000 more than it was a year ago. Taking a period of a quarter of a century, the company has been a remarkably good dividend-earning concern. It got into back-waters about the middle of that period,

but new methods of management brought about a good recovery, and while the dividend has been maintained at its present rate for several years, the elements of stability have been increased, a reserve of £30,000 and a balance forward of nearly £38,000 having been accumulated. A good part of these sums is represented by trade credits, but there is £11,483 in cash, and, of course, the loan capital £19,320, including interest is smaller than it would be if the company were not using some of its own money, in addition to the share capital of £105,835. Taking full years, the showing of the balance sheets for the last three years is as under.

	1913.	1912.	1911.
Profit.	£18,766	£19,040	£19,548
Brought forward	31,972	25,724	18,968
Available	50,738	44,764	35,516
Dividends 15 per cent.	11,250	11,250	11,250
Bonus share div. 5 per cent	1,542	1,542	1,542
Carried forward	37,946	31,972	25,724

The Company puts £4,000 each half year to the depreciation fund, the aggregate of which is now £108,808.

Mr. Edwin Hamer (President) occupied the chair at the half-yearly meeting of the North of Ireland Paper Mill Company, Ltd., which was held in the Grosvenor Hotel, Deansgate, Manchester, recently, and in submitting the report, said the directors had an unpleasant alteration in their position, for, instead of a profit which it had usually been their good fortune to announce, they had to report a loss of £1,000. The directors had been compelled to make changes in their management, and during the last two years they had considerable trouble with respect to their water supply for Ballyclare Mill. Encroachments were made on their supply, the water polluted and injury no doubt had been done to their trade. An arrangement was now made which might possibly help them out of the difficulty. His tongue was tied on many matters, yet because some things would possibly have to be arbitrated upon they would certainly be able to show, at least to the satisfaction of themselves, that they had sustained serious damage. The directors asked the meeting not to take a pessimistic view of things. The position at the mill was improving, and he thought they would soon work the concern round again to its former success. The Directors recommended payment of a dividend of 10 per cent, and they had £47,876 to carry forward. The report was passed, and the retiring officials re-elected.

The Dalsholm Paper Mills, Glasgow, formerly occupied by John Craig & Sons, Ltd., have been taken over by Smith, Stone and Knight, Ltd., of Birmingham and Bristol. There will be no change in the conducting of the mill, except that Mr. James Stuart, who had been in charge of the mill for a brief period, has accepted an appointment as English representative for Caldwell & Co., Paisley, makers of starches and papermakers' supplies.

At the annual gathering of the employees of the Abbey Paper Mills, owned by Grosvenor, Chater & Co., Ltd., Greenfield, Mr. Alfred Chater, speaking on behalf of the firm, said they were thoroughly satisfied with the work that had been done at the mill. They considered the workpeople had kept up the standard of paper if not actually improved upon it. It was, therefore, well that they should know what was going on in the trade. Last year he had referred to competition being greater than ever in consequence of the

large increase in the number of paper machines laid down in England and Scotland, the lower prices which most firms in London were making at. The competition then was nothing to what it was now. It was keener every day, and unless they kept up the quality of their paper, they could not hope to make a living for employed and employer. They could sell a thousand tons of good paper, but they could not sell 1,500 tons of bad paper.

Another mill fire is reported from Scotland. A section of the pulp store and a few minor buildings in the mill of the Clyde Paper Co., near Cambuslang, Glasgow, were destroyed by an outbreak, and damage estimated at £4,000 has been done. It is fortunate for the company that the main buildings of the mill have been saved and work is proceeding apace uninterrupted.

Manchester port ranks first in the United Kingdom among ports for the importation of wood pulp, which is now the principal commodity used for paper manufacture. Large quantities of the Canadian pulp arrives at Manchester, and everything points to the fact that the port is becoming an important one for Esparto grass imports. Of the 204,932 tons of Esparto, or 6,000 tons more than in 1912, which England imported, Manchester received 4,331 tons. By the way, Norwegians report that the recent shortage of Esparto has created an extra demand for sulphite and sulphate pulps.

Another mill which seems to have had a little bad luck in 1913 is Olive and Partington's, at Glossop. For 1912 it reported a gross profit of £67,873, or £62,290 after paying £500 in directors' fees, £2,400 in tax on incomes, and £2,683 in legal expenses. In 1913 the gross amount fell to £55,448, but there were no legal expenses to come out of this, and the net profit, after paying fees and income tax, was £52,548. The depreciation allowance is now reduced from £19,000 to £15,000, and the dividend on the ordinary shares from 17½ to 15 per cent, but if it may be assumed that the depreciation allowance is in no way excessive, this is £2,452 more than has been earned, for the balance forward is reduced from £6,864 to £4,412. Last year also the balance forward was cut into to the extent of £1,710. There is no reserve fund, but in the course of 13 years £197,500 has been applied to depreciation, and probably this is considered as good as those nominal reserve funds, which are wholly invested in the business. The goodwill still stands in the balance-sheet at the reduced item of £12,084. It should be added that only the 5 per cent preference shares are in the hands of the public.

Messrs. Henderson, Craig & Co., Ltd., wood pulp importers and agents for some Canadian mills, have declared a dividend of 25 per cent on their ordinary shares, and carried forward a balance of £3,043.

DR. FERNOW, PRESIDENT.

Dr. R. E. Fernow, Dean, Faculty of Forestry, University of Toronto, and Bristow Adams, of the U.S. Forest Service, have just been elected president and secretary, respectively, of the Society of American Foresters, the largest organization and, with the exception of the Canadian Society of Forest Engineers, the only association of professional foresters in the western hemisphere.

New Timber Royalty Bill of B.C.

(Special to Pulp & Paper Magazine.)

The Royalty Bill comprises these four things:—It fixes the royalty increase for 1915, and establishes a level of lumber prices on which future increases will be based. It provides seven five year periods for royalty adjustment; and it provides that for each of these periods, a given percentage of the price increment for lumber shall be added to the royalty. This percentage is 25 per cent for the first five years, and rises gradually to 40 per cent for the last five year period. The fourth of the accomplishments of the Royalty Bill is to re-adjust the rentals between the Coast and the Interior, and fix them for the whole period of the Act.

First, the Royalty increases for which the bill provides takes effect on January 1st, 1915.

Government, and is an equitable adjustment of Royalty between the Coast and the Interior. In the Central and Northern Interior, regions of great prospective timber development, the Government has imposed in the Royalty Bill a Royalty charge of 65c per thousand feet board measure. This again fairly represents the relative conditions as to lumber value in that region, as compared with the Interior and the Coast.

These three increases take place in 1915, and hold good for five years, or until 1920. Then comes the first readjustment based on increase in the actual lumber price of \$18.00 fixed by the Bill.

"Are they too high?" might ask some man of open mind who had not been fully informed. The central facts of this adjustment must be kept well in mind. They merely take up a certain amount of slack, and they impose upon the industry so small an increase for its raw product that they cannot fairly be claimed to



British Columbia Forests.

The Bill provides that these increases shall be, for the Coast lumber, from the present royalty of 50 cents to 75 cents, an increase of 50 per cent. This increase, however, is not applied arbitrarily, but is the result of raising the royalty on different classes of logs in a proportion which puts the highest increase on the best logs, and no increase at all on logs of such low value that the increase would mean that they would be left lying in the woods.

That plan is the particular application of the broad principle of Forestry:—To encourage the utilization of low grade material which otherwise might be wasted, and charge a fair rate of increase upon high grade material, which in any case would be utilized, because in utilizing it lies the chief margin of profit in logging.

The Royalty increase in 1915 provides that in the Interior, Royalty shall be increased by the use of the B.C. scale instead of the Doyle. That means an increase of probably 40 to 50 per cent in royalty to the

disturb existing financial conditions. They pre-suppose—as any reasonable man must pre-suppose—that this period of depression through which we have recently passed, and from which we are already emerging, is a temporary thing. They pre-suppose that in British Columbia, as in the rest of the world, the price of lumber will not continue to fall spasmodically; and that the general tendency will be up, and not down.

"Are they too low?" another open-minded man might ask. They might have been higher, for the Government had the whip hand, and they might have been two or three times as great, and still have been well within the limits of power. But this plan and policy of royalty re-adjustment is not merely a money raiser for the present, a financial emergency measure to wring the uttermost farthing out of the lumberman. Moreover, the financial condition of our lumber industry at present is not a very rosy one. In the aggregate, some of the mills are making a little money, and some



Logging in British Columbia.



A Telephone in British Columbia Woods.



Building Telephone in British Columbia.

are losing a little money, but the general average is to break a little better than even, that is at the present moment. A little better than an even break; that is in general the lumberman's situation to-day. If that were made by ill-considered royalty increase merely an even break, or a little below an even break, the result would be to deal a body blow to an industry not altogether upon its feet, although rapidly approaching that condition. War, grave financial stress, some unforeseen demand for public funds in the interests of the public might suggest some such step, but we face to-day no such condition.

The progressive increase in royalty based on percentages of the price increment above the base level selling price of \$18.00 is made subject to the result of governmental investigations and applied at the end of each five years, to hold for the next five years. Therein lies the great principle around which hangs this Bill; the principle that the Government, the people, and the lumbermen are co-operators in an industrial enterprise, the principle that by frequent re-adjustment based on the actual facts, timber royalty will keep pace with the growth in lumber values. In it lies not merely the great solution of the royalty question, but also the new principle of disposing of other public natural resources which will live.

Now, to take up the fourth provision of the Bill, which adjusts and fixes the rentals for the whole period.

"Why fix the rental?" the open-minded unformed man might say. "Why not leave that open. What's the use of tying it up for such a period?" To such a man the answer is this: Every British Columbia lumberman is fairly entitled to have the rentals fixed during the period of the royal re-adjustment bill, and during the period that his profit is shared between the Government and him.

Coincident with its enactment, this Bill will increase the timber royalty by somewhere between \$50,000 and \$60,000. By 1924 if the annual lumber cut increases on an average at the conservative figure of 5 per cent per annum, and lumber goes up moderately to \$21 per thousand feet, this Bill will have increased the royalty revenue to close on \$2,500,000 a year.

According to despatches from London, Eng., leading timber agents there declare that the new British Columbian timber royalties bill, to which the newspapers have given so much prominence, will have but little effect on the English business in view of the fact that British imports of British Columbia timber is less than two per cent of the total.

It is reported that a large pulp, paper and lumbering business, to be conducted on a large scale will shortly complete negotiations which will enable the owners to start operations in the vicinity of the Transcontinental Railway, a short distance from Cochrane. The capital behind the scheme is said to be largely English. The proposal is to erect mill at Yellow Falls, fourteen miles south of the bridge which crosses the Mattagami River at Jacksonboro, and it is also proposed to do all the manufacturing of pulp, paper and lumber on the site, the freight charges being too high to send the material away.

NEW METHOD OF PREPARING PULP.

Carl Bache Wigg, of Berlin, New Hampshire, Patentee.

Description by Patentee.

U.S. PAT. NO. 1,084,244.

The invention has for its object the production of pulp by a novel method from straw, cornstalks and similar substances, which is suitable for use as a substitute for ground wood pulp, and may be used as ground wood pulp is now used in the manufacture of paper, as for example, in the manufacture of news-print paper, which pulp compares favorably with ground wood pulp in quality and in cost of production. My new method, however, is also adapted for wood and similar cellulosic substances.

My new method involves confining the cellulosic substance to be treated, usually in small pieces, or blocks, in a digester, then withdrawing the air from them, thereby producing a vacuum, in the digester, or, more strictly speaking a partial vacuum, then pressing in sulfurous gas such as sulfur dioxide, SO_2 , to bleach the pieces and to soften but not destroy the ligneous matter, then injecting a solution of sodium chlorid, a bisulfite liquor may be employed, but for ordinary purposes the solution of sodium chlorid is preferable, as it is well suited for the attainment of the desired result, i.e., retention of the ligneous matter, although its character is probably modified, but its weight is not substantially reduced. Whether the cellulosic substance employed be straw, cornstalks or wood, I have discovered that when the air is withdrawn from it, a bleaching and softening gas may be pressed into intimate contact with the fibres composing it in such manner as to bleach them and also to soften but not to destroy the ligneous matter by which they are naturally bound together. The sulfurous or other gas may be pressed in say for one or two hours. The mass may be cooked in a solution of sodium chlorid for say, two or three hours, which is usually sufficient, although it may be cooked for a longer or shorter period of time according to the quality or grade of pulp which it is desired to produce. A finer quality of pulp may be produced by longer cooking. If a bisulfite liquor is employed in lieu of a solution of sodium chlorid the stock will be cooked for about the same length of time, and the resulting product will be a still higher quality of pulp. The expense of such treatment increases the cost of production. When the stock has been treated in accordance with my method it is washed, and if used as a substitute for ordinary ground wood pulp in the manufacture of news-print paper, further bleaching will not be required, but if it is desired for use for finer grades of paper it may be further bleached by a sulfurous gas or other bleaching agent. If used for news-print paper the stock when washed will be subjected to the action of a kollergang, disintegrator, grinder or refiner and then screened, as usual in the treatment of wood pulp. The resulting product when cooked in a solution of sodium chlorid is not cellulose, but is what might be termed a half cellulose, yet if cellulose is desired which is suitable for the finer grades of paper a bisulfite liquor will be employed and the stock will be cooked for a longer period of time.

The novel steps in my process consist in withdrawing the air from the cellulosic substance to be treated and then pressing in a bleaching and softening gas, thus to prepare the stock for cooking.

Ottawa Notes.

(Special to Pulp & Paper Magazine.)

Ottawa, Feb. 26.—A large incorporation at Ottawa was that of the Abitibi Power & Paper Company, incorporated, with \$7,000,000 authorized capital, recently. The new company will take over the business of the Abitibi Pulp & Paper Company, Ltd., and will continue its operations, but will presumably pay more attention to the development and sale of power on a large scale. The company will have its headquarters in Montreal.

As usual, timber and paper interests are concerned in a lot of legislation, which has been introduced in Parliament already this session, and is now under consideration. Among the measures referred to is one fixing new regulations for floating timber on the Pacific Coast. It provides that any person finding stray logs floating in the sea and tidal waters of British Columbia may take charge of them. If the owner, being notified, does not reclaim them and pay salvage within 45 days of notification, the finder gets possession of them.

Another act is one which will affect pulp and paper mills which discharge any effluent into navigable waters or waters which flow into navigable streams. Every corporation, other than a municipality, which is found guilty of allowing to be discharged into such waters any sewage, offal or refuse, or any matter poisonous, noxious, decomposing, refuse or waste, will be liable to a fine of \$200 and \$20 per day additional for every day during which the offence continues.

The new ground wood mill of the E. B. Eddy Company, described as one of the largest and most modern in this continent, is now operating at 75 per cent. of its capacity, and is turning out about 90 tons of pulp per day. The reorganization of its whole power plant which the Eddy Company has been carrying out during the past six months, and as a result of which the firm will produce all the power necessary for its extensive operations, is also nearly completed. Two out of the three units are running.

Pulp Mill for Ungava.

That English capitalists are to establish pulp mills in Ungava territory was the interesting announcement made here last week. It came in the form of an argument before the Railway Committee of the House of Commons by counsel for the Ottawa and Ungava Railway, which was asking for an extension of time. In pointing out the importance of the proposed line, counsel stated that it would connect with pulp mills throughout the territory through which it will run, those to be built by British capital. The route will be from the north-west arm of the Gatineau River and thence crossing the Ashwapiuchuan, Mistassini, Peribonka, Bersimis, Ontarode, Manicouagan, Penteccote, St. Marguerite, Moose, Roumaine, Natashawan rivers to Lake Melville, at a point on the boundary between Quebec and Labrador near St. Charles River. The extension of time was granted by the committee on these representations.

Another line which will serve pulp and timber in transit will be that of the Sudbury, Keweenaw and Bell River Railway Company, among whose incorporators is Mr. John Hamilton Hubbardman of Ottawa. The head office will be at Ottawa, and the result will be from a point near Sudbury, Ont., eastward to a point near Keweenaw Junction in Quebec, thence in a northeasterly

direction near the Transcontinental Railway in Quebec where it crosses the Bell River.

Although the Montreal Board of Trade and other such organizations throughout the country will shortly unite in a huge delegation to the Government to have the construction of the Georgian Bay Canal—in which pulp and paper men are vitally interested—commenced at once, there is no likelihood of an immediate start being made, according to an announcement made in Parliament last week by the Minister of Public Works. A resolution was proposed by Sir Wilfrid Laurier with reference to the commencement of work on the big project and in the speeches in its support which followed on the part of members on both sides of the House, it was pointed out that the canal would give facilities for the transport of immense supplies of pulpwood in the district through which it will be cut. However, Hon. Mr. Rogers announced that he would not act until he had received a report from a commission which he will appoint to go into the commercial feasibility of the project, the engineering feasibility having already been determined. He hinted, however, that there was a strong possibility of the section from French river to Lake Nipissing, which would serve pulp and paper interests particularly, being gone ahead with in the near future independently of the remainder of the route.

FLAT OR ROTARY SCREENS.

(Abbr. Translation from "La Papeterie," by C. E. Bandelin.)

It is well known that new inventions meet with many difficulties, and that they are only slowly adopted by the industry, especially as there often exists a sentiment of distrust against everything new. The paper manufacture is among these industries, and many improvements are those introduced only with difficulty.

Among the numerous machines and apparatus used in the paper industry, the flat screen certainly has been the one least changed. In many mills the old flat shaking screen is still met with, and it is astonishing to see, how tenaciously old papermakers keep on with this imperfect device. This is perhaps due to the lack of success of certain new constructions, the inventors of which having promised wonders, which have not always materialised.

It is sufficient to look over the periodicals of the paper industry to find that there is no final opinion as to the advantage of one or another system, and an apparatus is seldom met with, on account of which the inventor's imagination has been more taxed.

The first paper machines had flat screens. According to Hofmann's Handbook on manufacture of paper, the paper mill at Weddersleben, in Germany, used a screen from 1829 for hand-made paper. Bryan Donkin, of London, later improved the device and used it in connection with the paper machine, which bears his name, and in spite of an incessant work to improve it, it still has the same inconveniences which Hofmann described 25 years ago. He said at that time:—

"The main fault with all screens of this type is, that the knots and impurities remain on the plates, stick in the slots, and obstruct the passage of the pulp. The man in charge is obliged to scrape together in one corner the screenings remaining on the plates, in

"order to take them away. During this operation, "and notwithstanding all care, it cannot be avoided, "that part of the impurities is pressed through the "slots. The quantity of pulp passing through the "plates is increased after each cleaning, and the paper "then becomes heavier and less clean."

Another inconvenience is the formation of fibre bundles, more or less fitted together and called "cats," which often have a nucleus of impurities. In the case, that the pulp has not been refined in an absolutely regular manner and contains some long fibres, those fibres can settle across the bars separating two slots and cause the formation of "cats."

The author has for many years worked with the most different systems of flat screens, such as Goulds, Whites, Woges, as well as with the usual oscillating screens, and can state on account of his long experience in the use of these devices, that the flat screen does not in any of its forms give complete satisfaction as to work performed, labor required or wear and up-keep.

Quite different is the case with the rotary screen. It was first brought out by Wandal in Reutlingen, Wttbg., about 1862, and has since then been improved over and over again. The both, most modern types, built by Lamort and Dietrich-Seybold, can be regarded as the most perfect form in which these machines have as yet appeared.

Lamort's screen is especially suitable for fine papers, particularly its double type, while the Dietrich-Seybold screens can be used for all goods. The D.-S. screen has a slowly rotating cylinder without any shaking. The pulp passes from the outside in and is pushed onwards by oscillating plates below the cylinders. The knots and impurities retained by the slots are continuously removed by a sprinkler pipe. The cylinder does not carry away any pulp, and it is impossible for the impurities to collect in form of a roll inside the cylinder, which is only half full with diluted and screened pulp.

The mill, where the author is employed, manufactures the most different grades of paper on six machines, viz. pergamin, grease-proof, fine papers, exclusively from rags and without any ground wood-pulp, envelopes, strong wrapping, manila, colored papers, cheap wrapping from cellulose refuse and old papers, etc., and for all these grades the rotary screen now mentioned gives complete satisfaction.

It has been possible with such a varied production to determine exactly the most suitable width of the slots, and the quantity manufactured in each case.

For all fine papers the slots are about 0.014 to 0.012 of one inch, and for inferior grades 0.018 to 0.017 of an inch. No difficulties need to be feared with such fine slots, and the following results as to the production of the rotary screen will remove all doubts in this respect. As an average, 22,000 to 26,500 lbs. of fine and envelope papers are obtained per 24 hours on a machine with a width of 7.5 ft. of cut paper with slots of 0.014 to 0.012 of one inch, while slots of 0.018 to 0.017 of one inch would let through 26,000 to 31,000 lbs. of inferior grades. The screening is of course perfect with so narrow slots.

Some devices must, of course, be arranged in the riffler in order to catch floating impurities and to facilitate the work of the screens. This is easily done and it can be said that all pulp, which does not pass

through a D.S. screen, will not pass through any flat screen.

Another advantage of the rotary screens is also appreciated by many manufacturers; viz., the nearly complete non-appearance of rosin and grease spots on the wire. This advantage is especially valuable for manufacturers of this grade of inferior quality. The disappearance of such spots is explained by the fact that the rosin and grease are floating inside the screen. The cylinder, which turns slowly in the pulp, carries these floating particles away, when it moves upwards, and the spray pipe washes them away.

Every practical papermaker knows that repeated cleaning of the wire has an obnoxious influence on the production as well as on the length of life of the wire. The suppression of such stops has had for consequence an increase of about 10 per cent in the production. The wires also last for five or six weeks, instead of three to four. This improvement certainly depends upon a better screening of the pulp, as the old flat screen with its slots of 0.30 of one inch let the knots and sheaves pass, which afterwards made marks on the wire. These marks, by friction on the suction-boxes, quickly put the wire out of commission.

It may be added, that the expenses for lubricating and up-keep are so nominal with a rotary screen, that it is also in this respect very superior to the flat screens.

LINEN PAPER.

Special papers are more in demand every day, and in making, say, an imitation of linen, it is absolutely necessary to keep the purpose in view through every process, from the hollander and pug mill to the calendering and stamping. Unless the paper has been specially made, no stamping or other ornamenting process will be of any avail.

All paper to be linen-stamped must be tough and strong, but must have a considerable degree of softness, as elasticity is necessary for the success of the stamping. Hence a proper mixture of pulps and proper grinding are required, and, above all, the use of soft water. The best results are got with equal parts of hard and soft pulp, and a certain amount of filling. The following is a useful recipe:

Sulphite pulp	30 per cent.
New white first class bleached cotton	
pulp	30 per cent.
Bleached leafwood pulp	30 per cent.
Filling (asbestine, blanc fixe, China clay)	10 per cent.

The sulphite pulp must be selected with care, and not too much of it may be used, or the paper gets hard, and the rags for the cotton pulp must be well sorted, or else the best pulp-strainer is useless. The whole stuff hollander must be watched to see that over-grinding does not impart a parchment-like character to the paper. The sulphite and cotton pulps should be hollandered separately.

When the pulp reaches the wire, it must be remembered that it is not exactly greasy, so that there must be a strong shake with a moderate stroke. Stamped papers are generally thick sorts, say about 85 grammes per square metre. The suction boxes must not draw too strongly, and the web must not be too damp when it reaches the dry end, so that the press-rolls must be ample, so that the pressure is small, and felt marks are avoided. The number of drying cylinders must

be considerable, so that the drying is uniform. The best speed on the Fourdrinier is from 40 to 60 metres per minute, and the width of the wire should not exceed 2 metres.

On leaving the dry end, the paper is damped for stamping. The damping requires especial care, for it must be uniform, and must not be excessive, or the lustre of the paper will suffer. After damping the paper should be left overnight in a cool place for the moisture to distribute itself uniformly.

At the present day there are two sorts of stamping. One is produced on the goffering machine, with rollers of the best chilled cast iron, engraved to imitate the structure of linen, from the finest batiste to the coarsest fabrics. In any case, the pressure must be easily regulatable, and the engraved lines on the rollers must be kept clean. The paper should not contain more than 10 per cent. of filling, and the occurrence of hard grains likely to damage the paper and the engraving of the rollers must be carefully avoided. The stamping can be done on one or both sides. In the former case the paper must run between an engraved cylinder and one thickly covered with paper.

In the latter case it runs between two engraved cylinders. Papers stamped with engraved cylinders can be recognized by two tests: their unequal transparency and the constant repetition of the same fibre pattern. They are generally rough on the surface, and therefore not easy to write on with a pen. This defect can be partly remedied by calendering, but not entirely without destroying the linen pattern. Papers stamped with engraved rollers are used mainly by bookbinders and for wrapping.

The second method consists in pressing a linen fabric on to the web. The paper is passed between two rollers wrapped in linen, and receives the impression of the fibre on both sides. One difficulty is to avoid creasing and distortion. The development of a crease or a tear in the wrapping necessitates its total renewal. Another is that a closely-woven fabric is necessary, and the pressure soon flattens it so that it makes little or no impression on the paper. The first difficulty is preventable almost entirely by careful examination of the fabric before use, and accurate wrapping of it on to the cylinder. The best way to avoid the second difficulty is to substitute flat plates for rollers to give the impression. The method is expensive, because rollers are needed as well as plates, although the rollers are not of course engraved and because the paper has to be stamped sheet by sheet instead of passing in a continuous web, to be cut up as required afterwards. The sheets and steel or zinc plates covered on both sides with linen, are made up into piles of 20 to 25 plates alternating with sheets of paper, and the piles are rolled to press the pattern of the linen into the sheets. Instead of having a pile, single pairs of plates or several pairs side by side can be put through the rollers. This avoids the difficulty of getting uniform pressure throughout the whole thickness of a pile. Two women workers can in this way stamp 9,000 to 10,000 sheets of 60 by 46 cm., and weighing 80-90 grammes per square metre, daily.

Whether in web or sheets, the paper should never pass more than once through the machine. Once ought to be enough if everything is in proper order, and a second passage will infallibly confuse the two. The pressure must to some extent be regulated by the transference required; the greater that is, the heavier must be the pressure. Then, again, much pressure is

needed for getting deep impressions, especially on comparatively inelastic papers. The adjustment of the pressure, in fact, demands much skill and experience. Writings require a slight calendering between blank zinc plates after stamping, if the relief of the pattern is too great for them to be written on comfortably.

As regards the plates used for stamping, zinc plates are preferable in working with piles, steel plates for working with separate pairs of plates, as zinc plates are then likely to be bent or crushed at the edges. A bent plate can be straightened, but one with a crushed edge is spoilt beyond hope. Much, of course, depends on the way in which the press is fed. A pair of plates or a pile of pairs must enter with an edge parallel to the rollers, and not corner first, for example.

It is greatly conducive to the life of the plates and also to that of their linen covering, to make that double, using a coarser fabric next the metal and a finer fabric to imprint the paper. Both fabrics must be free from weaving faults, especially from knots or holes, and also from trace of size or filling. The paste used is always made with wheat starch, mixed with about a quarter of its weight of potato flour. The plates should extend about an inch beyond the paper all round for single sheet printing, so that the workman can take hold easily without touching the paper. When the linen has been fixed on to a plate, it is of great importance that it should not be used until the paste is perfectly dry, which will take at least twenty-four hours in a warm, dry room. Experience has shown that if the stamping is done with plates which are not perfectly dry, the relief is much more likely to be worn down by handling or even by the sheets being piled up in stock.—*Papier Zeitung*.

THE DANDY ROLLS AND ITS USES.

Now that the cost of making paper is steadily rising, and competition in paper-making is getting sharper, every paper-maker tries to increase his output, without diminishing the quality of his products. The dandy roll is an important factor in the value of a paper. It has been proved over and over again that other things being equal, that papers made with a dandy roll are better, especially in regard to strength, than papers made without one, provided, of course, that the roll is in good order. Hence the use of a dandy roll is especially advantageous with kraft papers. It is therefore of importance that every paper-maker should use dandy rolls proper for the paper in the making, without too much regard to the cost of them.

A special advantage of the dandy roll is that it increases the sizing quality of the paper, especially with thin papers, an important fact in view of the present high price of rosin. Every paper-maker knows that all irregularities in the flow of pulp on to the wire and in the shake interfere with the felting of the fibre, and make an unlevel web, made still more so by the action of the suction boxes. An important function of the dandy roll is to level up the web by its pressure. It is obvious that if the web is left in its unlevel state, it will vary in weight from square yard to square yard, and will show different sizing qualities at different places.

It is requisite to run the dandy roll in exact correspondence with the speed of the machine, especially with the very wide machines now in use. A paper-maker ordering a dandy roll must state exactly the thickness of the paper and the speed of the machine.

Proper work with the dandy roll depends also on the preparation of the stuff in the hollander. Pulp must be supplied neither too short nor too coarse. The pulp must felt well enough on the wire to resist the tendency to cling to the dandy roll. This tendency is the chief danger with ribbed and water-marked rolls, and causes waste of time while the attendant is putting matters right. He takes his own time to do it. This tearing out of fibres from the web by the dandy roll is due to badly hollandered pulp. With a heavy dandy roll, actual holes may be torn in the paper, and if the roll touches the wire, both of them wear rapidly.

This last observatoin obviously suggests that the dandy roll should be as light as possible, especially with wide rapid machines. English makers of these rolls are now copying their German and American confreres in this respect. It is true, of course, that a long roll must be comparatively heavy, but it is easy to have a system of counterpoises, so that just so much of the weight as is required to produce the desired effect comes upon the web. By means of this device, together with spring-bearings, the pressure of the dandy roll can be regulated to a nicety from its full weight downwards.

The place where the dandy roll should be put over the wire depends on the purpose it has to fulfil. For vellum papers it should be just behind the first suction box. If, on the other hand, it has to make a water-mark, it must be nearer the dry end.

Another point to be considered is the wrapping of the dandy roll. Its fineness must be arranged according to the work. The fineness must not be too great for thick papers, to prevent distortion, but for thin papers the fineness should be as great as possible. The relief of the water-mark is also of importance. It must be greater for thick than for thin papers. Similar remarks apply to dandy rolls for ribbing paper instead of water-marking it. The thinner the paper, the finer the rib-making wires must be, and vice versa. For fine papers, the dandy roll must be made of bronze or brass.

Although for water-marks there is not much question of wear with all sorts of dandy rolls, yet the marks and pictures soldered on to large dandy rolls are much less subject to wear than on small rolls.

In order to get an exact water-mark always, the dandy roll must be kept clean. The alum in the size attacks the dandy roll wires unless this is done, and the wires then make imperfect impressions. If there is any of the clinging tendency above spoken of, the reliefs of the dandy roll should be smeared with petroleum or turpentine.

Many liquids are squirted on to the dandy roll and wire to clean them, such as water, turpentine, petroleum, bisulphide of carbon, caustic soda lye, solutions of carbonate of soda or soap, and dilute sulphuric acid. All of these, except the last, do not hurt the roll covering, but the case is very different with sulphuric acid. Especially on Sundays, when, certain countries excepted, the machines are standing still after having been cleaned, the acid gets twenty hours to act on the metal, and even the best bronze will not resist it long. Hence sulphuric acid should not be used for cleaning dandy rolls.

As soon as the dandy roll is lifted off the wire it should be rinsed with a 3 to 4 per cent solution of carbonate of soda, and the water-mark wires should be cleared with a blast of steam, to clear the crevices from

scraps of pulp. This cleaning becomes much more difficult if it is delayed, as the pulp dries on the wires.

Care must be taken that letter-marks on the dandy roll have no sharp edges to injure the web passing below them. These edges will, of course, cut deeper the heavier the pressure of the dandy roll on the web.

Another point is to see that the bearings of the dandy roll run true. The writer had a curious proof of the truth of this apparently obvious proposition. A dandy roll which had been causing trouble was transferred to another machine, where less important papers were being made. It then acted perfectly, and it was found that the bearings in which it had worked in the first machine were badly worn, while those to which it was transferred, the machine having been less used, were nearly as good as new. Bad bearings make the roll catch up fibre from the web in its jerky movement, and often causes holes in the paper.

The dandy roll must be kept damp, and this is best done with two jets, one of water and one of steam. The steam jet should be as far below the dandy roll as possible, and on the pulp-strainer side. The steam also helps to destroy blisters in the web, and assists the action of the suction boxes by its heat.—Zentralblatt.

WORKING-UP WASTE PAPERS.

The treatment of waste paper is different according to whether a mill works up scraps regularly, or only now and then. In the latter case only the best sort of scraps is used. In the former case all sorts are worked up except the dearest.

Waste paper has become an important article of commerce, and there are special sorting establishments which will undertake to maintain a supply of any particular kind of scrap. As many as 40 different classes are made, and these are again subdivided according to colour.

The sorting and working up of the waste in small quantities for mixing in small proportions with whole stuff presents no difficulties, as no special machinery is wanted. The case is different when 10 tons or more of waste are used every year, and the sorting of such huge quantities cannot be done economically in a paper mill.

Large quantities mean large warehouse space, for the scraps must not be kept in the open air. A good airy shed is the best store-room, as it shelters the bales from wet while allowing free access of air. It should be as near the shop where the scraps are treated as convenient.

The best boilers for waste paper scraps are the spherical form, and the sorting-room should be over the boiling room. For sifting out dirt hand sieves can be used or an endless travelling screen. The sorting must depend on circumstances. Thus in sorting scraps with a view to making coloured paper, more attention must be paid to quality than to colour. The boiler should hold two tons of paper or more. It cannot well be too large. One ten feet in diameter is none too big.

It is economical to use an old boiler, as it is not used for heating, but simply to soak the scraps. If heat is employed, the size in the paper scraps will be removed entirely. Some is unavoidably lost, but whatever is left makes economy in the after-sizing of the new paper into the composition of which the scraps enter. The boiler can be filled loose with the waste paper, or it can be squeezed in if it is necessary to make the boil-

or take up a large quantity. It must, however, be remembered that wood papers swell, so that they, or scraps containing a large proportion of them, must not be packed too tight. It is essential that the rouser in the boiler should not be interfered with in its action. Three or four hours are required in the boiler, which is revolved about five times per minute. This treatment facilitates and shortens the subsequent pugmill work materially, and as the largest spherical boiler takes up no more than five horse-power—much less than a pug-mill—the economy of the previous treatment is obvious. No good results can be expected if the soaking is omitted.

As a substitute for the pug-mill, the kneading machine is not to be recommended.

The hollander must not receive the stuff too thick from the pug-mill, or the pulp will get too greasy. This danger is particularly imminent with long hollander rollers of large diameter, which work very rapidly.

As regards the work on the wire, the whole stuff must be greasy to prevent the water from running off too freely. It is often a good plan to warm the pulp a little, especially in making thick papers. Four suction boxes are used, two with suction and two without.

The felt of the upper couch roll may be an English unwoven one, if the paper has been well sorted beforehand, so that there are no coarse impurities. There ought to be three wet presses, with felts not too close, but not loose enough to mark the web.

The dry end should be ample, as gradual drying is advantageous. Papers to be satined on one side only should not come too wet to the drying cylinders, or the moisture will escape slowly and unevenly, and creases will be produced. A long wire is almost invariably necessary, if the machine is to be run at any reasonable rate.

We may now allude to some of the later ideas, some patented and some not, which are connected with using waste paper over again. Most of the patented processes involve the use of reagents for removing printer's ink and bleaching. Hence they are far too troublesome and expensive. It is far better—in fact, the only way—to sort the waste paper, and to use printed stuff only for making coarse coloured new papers.

In conclusion, it is to be remarked that supercalendering is advisable, when possible, for papers into the composition of which much old waste paper enters. The calendering conceals the look, indescribable in words, which such papers are too prone to manifest, and which the expert remarks immediately.

Under present-day conditions, it is practically impossible to make wall-paper, even the best kinds, without the use of old scraps. The case is different with wrappings. No strength is wanted in a wall-paper, but a packing paper does require a certain amount. Hence the use of old paper in its manufacture requires care, and respectable makers of wrappings, who are the majority of the trade, take care to use only the best unprinted white scraps, and then in not too large a quantity. Paper Zeiting

BRAZILIAN WOODS.

Their Utilization For the Manufacture of Wood-Pulp. Woods Suitable for Pulping.

The following are the native names of the species which are best adapted for that purpose. It is to be regretted that neither in French nor in English is there any name for so many species:—Lenha branca, morceguinho, cachete bicuyba, imbirá guaiaba, gindyba, araca, anda-assu, tatu, barriga d'agua, almecega, catanga de porro, pindahyba, imbauba, aca, caja, canella jaen, canella gosmenta, taroma, gotrana, mulungu, sapueia, figueira do campo, conde, louro, imbrissu, guaxima, bacurubu, palmito doce, bainha-capada, pinho do Parana.

Most of these are of very rapid growth, and at the age of seven or eight years reach a diameter equal to that of our European resinous woods at 25 years. Nearly all of them have a white or very light-coloured physical texture, with long flexible fibres. Apart from the pinho and the almecega, none of them contains resin. Almost all attain a height of 20 to 40 metres (66 feet to 112 feet, and a diameter of 75 centimetres to 2½ metres (say 30 in. to 100 in.), with the exception of the guaxima, which is a shrub.

Analysis of Some of the Woods.

	One month after felling.		Dry timber.	
	Water.	Ash.	Gel. Inluse.	Ash. Inluse.
	per. 100.	per. 100.	per. 100.	per. 100.
Canella gosmenta	34.22	0.71	48.92	1.08
Canella jaen	38.61	0.61	43.75	1.00
Taroma	32.94	1.29	46.97	1.06
Gotrana	35.32	0.75	45.75	1.12
Mulungu	54.53	1.24	39.99	2.74
Imbauba	28.92	0.96	47.71	1.31
Sapueia	33.57	0.48	44.25	0.58
Figueira do campo	39.75	1.54	40.99	2.54
Conde	34.67	0.79	44.31	1.15
Imbrissu	49.76	0.81	37.52	1.36
GUAXIMA bark	54.82	5.58	12.71	11.90
Doitto wood	43.56	1.06	34.81	1.85
Bacurubu	28.15	1.57	46.54	2.07
Palmito doce	39.45	0.82	49.59	1.19
Bainha-capada	41.77	1.05	31.06	1.80
Louro	19.57	2.74	52.17	3.40

Volume and Distribution.

There have been carried out a large number of estimates of the volume occupied by these white woods. In a general way it may be said that it decreases in inverse ratio with the altitude in tropical forests. Thus the writer has measured in forests at an altitude of less than 100 metres 550 cubic metres of white wood per hectare (7,862 cubic feet per acre), while at 250 or 300 metres (say, 825 to 1,000 feet) the proportion is no more than 200 cubic metres (2,860 cubic feet per acre). At a height of 500-600 metres (say, 1,700-1,900 feet) it falls below 100 cubic metres per hectare (1,430 cubic feet per acre). These figures relate to saturated trunk wood, no account is taken of the branches or of the exterior wood, which by themselves form a volume equal to nearly one half of that of the trunk-wood.

The specific gravity of all these woods is very variable, ranging between 0.350 and 0.750, so that on an average a cubic metre would weight 550 kilogrammes (1,212 lb.) and would yield about 200 kilogrammes (44 lb.) of mechanical pulp, or 125 or 150 kilogrammes (275 lb. to 330 lb.) of unbleached chemical pulp.

Conditions of Exploitation.

The conditions of exploitation naturally depend upon the topographical situation of these forests. It is possible to come to an agreement with the proprietors or with the companies which exploit the cabinet woods

Mr. J. K. L. Ross was elected to the vacancy on the International Board created by the death of his father, the late Mr. James Ross. Mr. Ross is at present in Brazil.

only, or to acquire certain of the forests and work them as a whole. On this would depend the net cost per cubic metre of wood delivered at the mill. It is impossible to state an average value per cubic metre; the writer will merely give, as a guide, an example corresponding to an industrial exploitation of relatively little importance, of which the mills are situated at a short distance from a navigable river connected with a seaport.

Whether the wood is worked by the enterprise or whether it is purchased from the exploiters, let it be supposed that its cost, delivered to the mills in the proximity of the river, is 3*f.* 50*c.* (2*s.* 11*d.*) per cubic metre. Let it also be assumed that the cost of labour is 6*f.* (5*s.*) per day of 10 hours, with 300 working days per year. This being so, let us calculate what would be the cost price of 100 kilogrammes (220 lb.) of mechanical pulp for an output of 20 tons of pulp per day. This works out as follows:—

Estimated Cost.

Motive power: 1,500 h.p., produced by burning wood-chips, etc., the net cost of which would be 1*f.* (10*d.*) per cubic metre.

Of this fuel 60 cubic metres per day would be necessary, or for 100 kilogrammes of pulp	6 <i>f.</i>
For 100 kilogrammes of pulp $\frac{1}{2}$ cubic metre of white wood is sufficient, or	1 75
Labour: in mill, 50 men at 6 <i>f.</i> , 100 <i>f.</i> , for 100 kilos	1 75
Land transport, 20 men at 6 <i>f.</i> , 120 <i>f.</i> , for 100 kilos	60
10 mules at 2 <i>f.</i> , 20 <i>f.</i> , for 100 kilos	10
River transport, 100 h.p. steam barge, 100 tons, with crew of 10 men would cost about 20 <i>f.</i> per 20 tons manufactured for 100 kilos	10
Lighting oil, etc., 25 <i>f.</i> per day for 100 kilos	10
Management and staff, 150 <i>f.</i> per day for 100 kilos	75
Amortization of capital, 800,000 <i>f.</i> amortized at the rate of 15 per cent. per annum, or per working 100 <i>f.</i> for 100 kilos	20
	<hr/> P. 42

This cost of P.5.42 per 100 kilogrammes, or 5.42*f.* per 220 lb., as for pulp delivered at the port of exportation. To this must be added:

Transshipment aboard steamer, per 100 kilos	20
Export duties, 10 per cent. ad valorem	55
Freight from Brazil to an English port, 20 <i>s.</i> per ton, or for 100 kilos	2 50
Cost of 100 kilos, pulp f.o.b. at an English port	P.8.67
The present selling price of pulp per 100 kilos, being	10 00

There is a net profit of

P.4.33

If this calculation be correct the annual profit should be 200,000*f.* (i.e., 3*s.* 5*d.* per 220 lb., or £10,292 per annum).

Capital Necessary.

The capital necessary for this enterprise is made up as follows:

Machinery, 1,500 h.p., for wood fuel	1,125,000
Apparatus: rasping-machines and accessories	200,000
River steamer, 400 tons capacity	125,000
Barges	200,000
Transport and setting up	50,000
Sundries and unforeseen expenses (the land is given free)	75,000
	<hr/> P.800,000
Floating capital	400,000
Total capital	<hr/> P.1,200,000

or, say, £12,500

The profit would thus be about 21 per cent on the total capital.

It will be remembered that in the foregoing calculations it is assumed that the wood is supplied by an exploiter at the price of F. 3.50 per cubic metre delivered at a certain distance from the mills, and that the pulp manufacturers have only to load it and transport it by a Decauville light railway to the factory. If the forest were to be exploited by the manufacturers themselves the business would be rather more complicated.—London Times.

PINE OIL OR LIQUID ROSIN.

By H. BERGSTROM.

(Abbrev. Transl. from "Svensk Papperstidning," by C. E. Bandelin.)

It is well known that a liquid "soap," floating on the black lye, is obtained in the soda pulp process, when pine wood is digested. This "soap" has already been the object for investigations, and so-called "liquid rosin" is at present generally prepared from it by treatment with acid sulphates or acids. This soap mainly consists of sodium-salts of higher organic acids, which consequently are constituents of all the liquid rosin.

A light yellow oil, with a bottom sediment of white crystals, which may be separated from the oil by pressing, is obtained together with a small quantity of a dark-colored, very volatile liquor, when the brown liquid rosin is distilled in vacuo. These crystals consist of rosin acids, which crystallise in an alcoholic solution as triangles or prisms with corners cut off obliquely. A brittle, yellow to brown rosin is obtained, when the purified crystals are melted, and can be used as common rosin for size.

The slowly drying oil obtained from the vacuum distillation contains rosin acids in solution together with higher fatty acids and indifferent substances. Palmitic acid has been found among these fatty acids, oleic acid very probably occurs among them. When superheated the oil gives sebacic acid in great quantities. Besides some acid of the linolenic series probably is present.

The indifferent substances have as yet not been thoroughly investigated. The first distillate from the distillation in vacuo is rich in indifferent substances, among which a terpene has been found.

Phytosterine, an alcohol, has also been found, which in vacuo distils without disassociation at a temperature above 360 deg. C., and which generally occurs in vegetable fat. This phytosterine has been prepared directly from the soap, not from the pine oil.

The raw material for the pine oil, the soap, contains always some black lye, which at the disassociation with acid forms lignine, which, however, may be separated from the oil by mechanical means. Pine oil consequently contains:

Indifferent substances.

Phytosterine in the soap.

Palmitic Acid.

Oleic Acid (very probably, but not directly shown).

Acids, belong to the Linolenic series.

Rosin Acids.

Small quantities of lignine substances may also occur as occasional constituents as well as water.

The researches, the results of which now have been outlined, must, however, only be regarded as preliminary, and the pine oil can, of course, also contain other ingredients besides the now mentioned substances.

The quantitative composition of the pine oil is varying depending upon the quality of the digested wood. The following average figures have been obtained from different samples:—

	P.c.	P.c.
Unsaponifiable.	6	10
Rosin Acids.	35	50
Fatty Acids	40	59

Palmitic acid was found present, but amounting to less than 5 per cent of the pine oil. To these analyses may be remarked, that under the circumstances the results obtained by methods used for mixtures of known substances, must be taken somewhat cautiously.

The pine oil from surface wood, for instance slabs, is relatively rich in fatty acids, while inside wood from the same tree gives a pine oil more rich in rosin and thickly flowing. Certain kinds of pine in the South-eastern States don't contain any or only small quantities of fat. Such wood gives a nearly solid rosin in the soda pulp process, consisting mostly of rosin acids.

At present the pine oil is usually sold as obtained from disassociation of the soap. It is, however, probable that a further rectification of the oil would be advantageous on account of the price paid and with the now available knowledge of the composition of this oil.

GLYCERINE IN PAPER.

Sindall and Bacon.

The use of glycerine is resorted to in the production of certain types of paper, notably those which need to be slightly hygroscopic and capable of retaining some moisture. Some of the so-called dry copying tissues depend for their qualities on the presence of hygroscopic substances, amongst which glycerine takes a foremost place. Chlorides of zinc, calcium and magnesium are instances of metallic salts which absorb moisture on exposure to the ordinary atmospheric conditions.

The qualitative tests by which the presence of glycerine may be detected are of a simple character, but the quantitative estimation of the actual amount present is a more complicated process.

The method of detecting the glycerine is based upon the following reaction:—When an alcoholic solution of phenolphthalein is added to a solution of borax the rose red colour obtained is discharged by glycerine in the cold, and restored on heating.

The solutions employed for this test are as follows:

1. A half per cent. solution of borax obtained by dissolving 1 gram of borax in 200 ccs. of water.
2. A weak alcoholic solution of phenol-phthalein obtained by dissolving 1 gram of phenol-phthalein in 100 ccs. of alcohol.
3. The solution containing glycerine which in the case of a blank test may be made up conveniently by adding 1 gram of glycerine to 100 ccs. of distilled water.

The test is applied by adding to 2 cc. of the borax solution a drop of the phenol-phthalein solution so as to produce the well-known rose red colour. Sufficient of the glycerine solution is slowly added until the colour

is completely, or almost completely discharged. If the mixture is then heated the red colour reappears, and on cooling off it is again discharged.

The distinct reaction can be obtained when 2 cc. of a 2 per cent. solution of glycerine is used. The complete discharge of the colour depends partly on the use of a very small quantity of the phenol-phthalein solution, and partly upon the quantity of glycerine solution added. Since 2 cc. of a 2 per cent solution of glycerine corresponds to 0.04 grams of glycerine, the reaction is a delicate one, and it can be utilised for even smaller quantities.

Hence in the case of a paper containing 0.25 per cent. of glycerine it would not be necessary to extract a very large quantity of the paper in order to obtain a reactive quantity of glycerine. Thus 20 grams would yield 0.05 grams of glycerine, and if this were extracted and obtained in a fairly concentrated form, the extract would respond to the test.

Some precautions are necessary in getting the glycerine in a properly concentrated form from paper in which it is present. The glycerine is volatile in the presence of water, and if paper containing a very small proportion is extracted with a large quantity of water, with the idea of evaporating the water so as to obtain a concentrated solution, some of the glycerine is lost during the process of evaporation.

The following plan may be resorted to as a means of extracting the whole of the glycerine in a given weight of paper, using a minimum amount of water. If, for example, it is necessary to take 20 grams of paper, the 20 grams is cut up into small slips and divided equally into five lots of 4 grams, each lot being placed in a test tube. The first 4 grams is covered with distilled water and heated on a water bath. The liquid is poured off into test tube No. 2, the paper in No. 1 being covered with a second quantity of distilled water. The solution from No. 2, after warming, is transferred to test tube No. 3 containing the third lot of 4 grams, while the solution from No. 1 is poured off again into No. 2. In this way, by gradual transferring the solution from tube to tube, the whole of the glycerine is obtained in a small quantity of water, and the reactions may then be found as described, without concentrating by evaporation.

The method described is probably the simplest which can be applied in the ordinary way, but as confirmatory tests others are available. Thus Reich recommends heating cautiously to 120 deg. C. a mixture of a fairly strong aqueous solution of glycerine with fused phenol and an equal quantity of sulphuric acid. A brown solid mass is produced which, after cooling and dissolving in ammonia, produces a carmine red colour. Substances which are easily carbonised by sulphuric acid must in this case be absent.

Another test is based on the decomposition of glycerine when evaporated with acid potassium sulphate and the subsequent distillation of the mass. Acrolein is formed by this reaction, and the distillate can then be tested by the well-known Schiff's reagent. This reagent is prepared by decolorising a dilute solution of fuchsine or rosaniline with sulphurous acid. When the distillate is brought into contact with Schiff's reagent the red colour is restored. This reaction is also characteristic of formaldehyde.

Either of these two methods can be used to confirm, if necessary, the indications afforded by the simple test with borax—"The Paper Makers' Monthly Journal."

PULP AND PAPER NEWS

The Inland Pulp and Paper Co., Thorold, Ont., which recently acquired the business and plant of the Colonial Wood Products Co., have orders on hand which will keep the mill operating to full capacity for many months. H. B. Eshelman is the manager. It was some time ago intended to build an extension on the land of the company to the south, but as the new Welland Canal construction has taken up fifteen acres out of the twenty-eight owned, the matter of any additions has been held in abeyance.

At the annual meeting of the Interlake Tissue Mills held in Toronto on Feb. 18, satisfactory reports were presented for the past year. The plant has been in operation at Merriton only about twelve months, but many special lines are being produced in toilet and decorative tissues, light weight wrappings, crepe napkins, sanitary crepe towels, tablecovers, and special tissue lines for wrapping fruit, brass beds, etc. All the old officers were re-elected as follows: President and Manager, George Carruthers; Vice-President and Treasurer, I. H. Weldon; Secretary, S. F. Duncan.

The annual meeting of the Provincial Paper Mills Co., Limited, who operate the Barber Paper and Coating Mills at Georgetown, the Montrose Paper Mills, at Thorold and the St. Lawrence Paper Mills, at Mills Roches, Ont., was held in the head offices in Toronto last week. The reports for the year showed that business had been well maintained, considering the depression which has existed and the fact that the output of the company was increased by some fifteen tons by reason of the erection of the new plant at Thorold. The outlook was regarded as very promising. The mills of the company now produce about seventy tons per day of book, bond, writing and ledger papers in addition to some eight tons of coated stock. The officers elected were: President, I. H. Weldon; Vice-President, T. A. Weldon; Secretary-Treasurer, S. F. Duncan; Directors, S. B. Monroe, G. R. Copping and Ralph Emery. After the business proceedings, the members were entertained to dinner at the National Club. The company will remove into new offices in the Bell Telephone Building, which are being vacated by the Toronto Harbor Commissioners, this month.

The annual meeting of the Lincoln Paper Mills Co., Limited, was held at the company's office in Merriton, Ont., recently. The usual gratuity of six per cent was voted to the employees of the mills, based on their individual earnings during the past year. Considering that trade generally has been a little quiet, very good reports were presented for the past twelve months. The following officers were elected for the current year: Welland D. Woodruff, president; A. S. Woodruff, vice-president, and W. M. Shea, secretary-treasurer.

J. B. Beveridge, manager of the Dryden Timber and Power Corporation, Dryden, Ont., has returned from a business trip to Chicago, and other western cities. It is expected that the plant at Dryden, which has been undergoing extensive alterations with a view to increasing its capacity of sulphate pulp and building pa-

pers, will be ready to ship about the middle of the present month.

W. Grierson, manager of George Newnes, Limited, the London, Eng., publishers, along with Mr. Bathgate, a director of Messrs. Pearson, Limited, spent a few days in Toronto recently. Mr. Grierson was investigating the improvements to machinery in connection with the magazine publishing business, and says that the circulation of British periodicals is greatly increasing in Canada.

There are many rumors heard that Northern Ontario is to see remarkable development in the pulp and paper line at an early date. The Northern Ontario Pulp and Development Co. has been formed with head offices in Toronto to carry on operations in pulp wood, lumbering and other lines. The capital stock of the company is \$150,000. There is also a report that Toronto and other capitalists may erect a new sulphite plant near Cochrane during the coming year. Word also comes from Cochrane that a large pulp and paper and lumbering business is to be conducted at Yellow Falls, fourteen miles south of the bridge which crosses the Mattagami river at Jacksonboro on the line of the Transcontinental Railway. It is reported that the capital behind the proposition is largely English and that, for some years past, representatives of the concern have been inspecting the country for many miles west of Cochrane studying water powers and timber resources. It is understood that negotiations are now well advanced but, in the meantime, the promoters refuse to divulge anything very definite. It is known that engineering companies have been preparing preliminary plans for some time for a large pulp and paper proposition, but whether anything material will develop in the near future will, of course, largely depend on the way trade opens up this spring and the recovery in money market conditions. The number of new industrial concerns, which were granted a charter in the Province of Ontario during the past week was twenty-six and the total authorized capital was \$3,500,000, which would point to renewed activity in business in the near future.

The Holden-Morgan Co. of Toronto, manufacturers and patentees of the Holden-Morgan bread wrapping machine, which is said to be the only one in America which will wrap bread automatically, with any kind of paper, have sold out half of their interest in the patent rights for the United States, to Standard Wrapping Machines, Limited, Toronto, who control the foreign output and patents, for one hundred thousand dollars. The Holden-Morgan Co. still retain fifty per cent of the stock in Standard Wrapping Machines, Limited. The new invention will be manufactured on the other side, and many inquiries are already coming in. Holden-Morgan Co. will shortly place on the market an automatic hand wrapping machine for the use of smaller bakers. Paul Stearns, of the Atlas Baking Company, Milwaukee, who is the father of bread-wrapping on this Continent, was recently in Toronto, and placed orders for the new machine.

The Bertrand Lockhart Lumber Co., Limited, has been granted a charter with head offices in Port Arthur, and a share capital of seventy-five thousand dollars. The company is empowered to purchase, sell and deal in timber limits and timber locations, lumber, building materials, ties and pulp wood. The incorporators are: Allen G. Beaman, John H. McLennan, Joseph P. Bertrand, Herbert A. McKibbin, and William Marrigan, all of Port Arthur.

At a meeting of the Executive of the Great Waterways Association, which was held recently at Berlin, Ont., one of the matters discussed was that the water available at Niagara under present treaties is practically now all apportioned among the different power companies and that, by the end of the present year, the Ontario Hydro-Electric Power Commission will be using eighty per cent of its available supply. Aside from an increased supply under new arrangements, the extension of the Hydro-Electric Commission's service to new municipalities and for farmers and for radial railways would be impossible, and the municipalities at present supplied from Niagara would be forced largely to go back to steam or a dual service. In addition to the great expanding need of the Niagara zone, it is realized that the power possibilities in connection with the enlargement along the St. Lawrence river would convert that section also into a great electric manufacturing district. A general deputation from the districts affected will go to Ottawa at an early date.

Fire recently visited the premises of E. H. Harecourt & Co., publishers and lithographers, Toronto, doing several thousand dollars damage. Only the existence of a fire wall, which surrounded the furnace where the fire started and which extended to the roof, prevented the destruction of the whole establishment. The loss was principally on paper, machinery and lithographers stones. Some valuable government maps were also destroyed.

R. M. White, of Toronto, who is a son of Aubrey White, Deputy Minister of Lands, Forests and Mines for the province of Ontario, has been appointed manager of the Equitable Trust Co. of London, England. He left last month to take up the duties of his new position. The Equitable Trust, the President of which is Sir Max Aitken, M.P., is the name of the merged companies, the Western Canada Trust and the Canadian and Empire Investment Trust. It has been decided to increase the capital seven hundred thousand pounds and to broaden the scope of operations by making investments elsewhere than in Canada. Mr. White, the new manager, is only twenty-seven years old.

J. F. Ellis of the Barber, Ellis Co., Limited, Toronto, and wife, sailed last week on an extended tour of the Mediterranean and Southern Europe. They will be absent several months.

W. H. Craft, representing Alex. Cowan & Sons, Edinburgh, Scotland, and Andrew Robson, representing Andrew Whyte and Sons, Limited, and the Allanvale Paper Co., Edinburgh, Scotland, are among the travellers for Old Country paper houses, who are now calling on the trade in all the principal Canadian cities on their annual visit.

Barber, Ellis, Davis, Limited, is the name of a new company which has been recently organized in Calgary, and will carry on a general business in paper and printers' supplies. This concern is separate entirely from the Barber, Ellis Co. of Toronto, and the President is F. M. Ellis, of Brantford, and the managing director.

The Northern Ontario Pulp and Development Co., Limited, have been granted a charter with a share capi-

tal of \$150,000, and head offices in Toronto. The company is empowered to carry on the business of pulp and paper manufacturers, lumbermen, timbermen, saw millers, and to buy, sell and deal in timber and timber limits, etc. The incorporators are: Harold E. Manning, Bert H. L. Symmes, Robert H. Green, Percy W. Beatty, and Walter L. Lockhart Gordon, all of Toronto.

Gummed Paper, Limited, of Brampton, which has an output of three tons per day of gummed stickers and tape, and is the first industry of its kind in Canada, has begun operations under the management of E. R. Colbert.

John R. Barber, of Georgetown, the veteran paper manufacturer, was in Toronto last week for the first time in many months. He is looking well after his recent poor health.

NEWS PRINT EXPORT.

The export of newsprint paper, which, after rising rapidly up to June of last year, showed a tendency during the summer to slacken off a trifle, resumed its upward movement towards the close of 1913 and November figures show a total exportation which for the first time exceeds one million dollars for the month. The actual total, \$1,037,207, compares with \$631,227 for the same month a year previous, showing an increase of well over 50 per cent.

The export of chemical pulp in that month was also a record-breaker, and was about 70 per cent in excess of the amount exported in November, 1912; while mechanical pulp reached a record in October, but fell off in November to an amount little in excess of November, 1912, and inferior to several of the intervening months.

The following table shows the exportation of newsprint paper to the United States and to all countries (including the United States) for the respective months of the fiscal year to date, and also the exportation of chemical pulp and of mechanical pulp for the same period.

Paper Exports.

	U.S.	Total.
April	\$ 462,909	\$ 596,554
May	611,369	810,575
June	728,462	874,284
July	688,467	793,898
August	740,384	889,645
September	778,765	941,986
October	864,020	976,028
November	973,975	1,037,207
8 months, 1913	\$5,848,351	\$6,918,177
Nov., 1912	426,404	631,227
8 months, 1912	2,195,630	3,110,458

Pulp Exports.

	Chemical.	Mechanical.
April	\$ 202,110	\$ 143,126
May	201,276	234,494
June	121,199	173,445
July	218,302	251,284
August	203,542	267,171
September	232,835	399,057
October	233,159	467,878
November	273,278	357,688
8 months, 1913	\$1,685,701	\$2,292,143
November, 1912	178,032	331,625
8 months, 1912	1,300,389	2,430,459



The Markets

CANADIAN MARKETS.

Market conditions remain about the same as they have been for some time past. News print mills are busy and prices are well maintained. The number of inquiries for news print from the other side of the line is very satisfactory. Book and writing plants as well as coated paper plants are not rushed with business, but report that orders are picking up somewhat with the advent of spring, and things are taking on a more promising air. The printing trade is rather quiet at present, but more encouraging results are looked for. Wrapping paper and kindred lines are quiet, and there is still considerable price cutting going on, even in small quantities. The number of inquiries for ground wood pulp is large, but sales are not numerous. The sulphite situation is keeping up well, stocks are low, and prices are firm. Mixed papers are dull and in fact in all the cheaper grades of paper stock there is little moving at the present time. Roofing stock is assuming a better tone.

Prevailing quotations are:

Paper.

News (rolls \$1.95 to \$2.00 at mill in car load lots.
News (sheet) \$2.15 to \$2.30, at mill in car load lots.
News sheet \$2.35 to \$2.75 at mill in less than car load lots.
Book papers (earload) No. 3, 3.75c to 4.50c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book paper (ton lots) No. 2, 4.50c to 5c.
Book papers (earload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 7.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, \$2.00 to \$2.50.
Fibre, \$2.75 to \$3.50.
Manilla B., \$2.40 to \$3.75.
Manilla No. 2, \$3.00 to \$3.50.
Manilla No. 1, \$3.00 to \$3.75.
Un glazed Kraft, \$3.50 to \$4.50.
Glazed Kraft, \$3.75 to \$5.00.

Pulp.

Ground wood, at mill, \$15 to \$16.
Ground wood, \$22 to \$24, delivered in United States.
Sulphite (unbleached), \$42 to \$43, delivered in Canada.
Sulphite (unbleached), \$42 to \$44, delivered in United States.
Sulphite (bleached), \$56 to \$57, delivered in Canada.
Sulphite (bleached), \$57 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90.
No. 1 soft white shavings, \$1.75 to \$1.80.
No. 1 mixed shavings, 50c.
White blanks, 90c.
Ordinary ledger stock, \$1.15 to \$1.20.
Heavy ledger stock, \$1.40 to \$1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c to 50c.
No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
No. 1 print Manillas, 60c.

Folded news, 45c to 50c.

Over issues, 50c to 52½c.

No. 1 clean mixed paper, 30c.

Old white cotton, \$2.50 to \$2.75.

Thirlds and blues, \$1.30 to \$1.32½.

No. 1 white shirt cuttings, \$5.00 to \$5.25.

Blue overall cuttings, \$3.50 to \$3.60.

Black overall cuttings, \$1.75.

Black linings, \$1.75.

New light flannelettes, \$4.50.

Ordinary satinets, 70c to 75c.

Flock, 85c.

Tailor rags, 65c.

NEW YORK MARKETS.

Office Pulp & Paper Magazine.

209 Broadway, New York.

Paper mills are now fairly active, and are taking their normal supplies of chemical pulp. A few new contracts have been made both in bleached and unbleached sulphite, and the feeling in this market is that paper mills are now about caught up with their old contracts. Advices from abroad show a slight upward tendency in unbleached sulphite, which is likely to have some influence on the market here when the time arrives for making contracts. Numerous importations have been made in rather large quantities, and there is no excess supply at local docks. There has been a considerable inquiry for spot lots, some of which have not yet been filled on account of delays in the arrival of ships carrying the consignment for such orders. A scarcity of sulphate and Kraft pulp on this side has been reported in the interval. Importers having spot orders on hand have been unable to fill them, as there was no surplus on which to draw. It is difficult to obtain such pulp from Scandinavia, as navigation is now closed. In some cases spot orders have been filled in sulphite at a loss in order to eliminate the high costs of storage.

An increasing volume of business in mechanically ground wood pulp has been going on in the local market at prevailing prices. Manufacturers are confident that a better demand for their product is not far off, and that the current year will be a good one in ground wood. Spot lots are commanding fair prices, selling at \$22.50 to \$24.00 a ton.

Domestic rag stock has been in a little better position than for more than two months. Paper mills have had sufficient orders on hand to use a good portion of the excess accumulation in this stock at the first of this year. Prices are still very low, but an increase will follow any active demand. The feeling is that prices are now at rock bottom and the future holds bright hopes among dealers. Importers have been taking advantage of the falling off in prices of foreign rags abroad, and many large importations have been made in the interval, although there were only a few spot orders on hand. Importers are willing to sell at buyers' prices at present, but are confident that a slightly better demand than at present, a rise in price will follow. As in domestic rags, paper mills are using their excess accumulations, and will soon

be in the market for more stock. Prices are as low now as they will ever go.

The demand for book paper stock has been the cause of a good deal of activity in the better grades of old waste papers, particularly hard and soft white shavings. Very recently, however, there has been a falling off in the demand for this grade. Some dealers reported that their shipments had fallen from 100 to 35 tons a week. A growing demand for boxboards has caused a brisk movement in the lower grades, and prices are moving upward. Strictly over-issue news has been in fair demand and prices are firmly maintained at 65c to 70c. No. 1 mixed papers have advanced from 30c to 35c, to 37½c to 42½c, and the feeling is that they will continue upward.

Pulp.

Ground Wood, No. 1, 20c to 24c, delivered.

Ground Wood, No. 2, 17c to 19c, delivered.

Unbleached sulphite, domestic, 1.90c to 2.20c per pound, delivered.

Unbleached sulphite, imported, 1.75c to 2c per pound, ex-dock, New York.

Bleached sulphite, domestic, 2.80c to 3c per pound, delivered.

Bleached sulphite, imported, 2.60c to 3.05c per pound, ex-dock, New York.

Easy Bleaching sulphite, imported, 2.05c to 2.20c per pound, ex-dock, New York.

Unbleached sulphate, imported, 1.75c to 2.10c per pound, ex-dock, New York.

Bleached sulphate, imported, 2.60c to 2.80c per pound, ex-dock, New York.

Kraft pulp, imported, 1.80c to 2.00c per pound, ex-dock, New York.

Soda pulp, domestic, 2.10c to 2.25c per pound, delivered.

Paper.

Business in paper has been gradually improving with the general tendency of business in the whole country. Snowstorms have caused tie-ups in shipments and mails containing orders which probably accounts for a slight easing in the local market. Along with this were the convention of jobbers and manufacturers in this city, and there was a general tendency to put off business until after these gatherings.

Prices have been firm, and in some cases show rather hardening tendencies. Paper bags have been going along in a fair way under the new lists, which were put into effect the first of the year. A fair demand for all grades of news has prevailed and all contracts are now made for the current year. Transient business in news has been fair, and manufacturers are hopeful of a still better demand. Boards, writings and ledgers have enjoyed some inquiry, especially among the higher grades. Book papers are still somewhat behind in delivery, and continued activity holds little hope for catching up in the immediate future.

Increased products of Kraft have created a better demand and the trade is confident of a bright year. Tissues have been in fair demand at prevailing prices, but the business of current values has been somewhat disturbed by a cut which was made several days ago, when certain mills of the middle west came into the market with offers of white tissue in car lots at 40c a pound, while the market quotation has been 42½c to 45c a pound on 1,000-cum and car lots. The demand for wrapping has been a little easier, but prices are firmly maintained. Boards are improving, and values show an upward tendency. A number of manufactur-

ers have advanced the price of strawboard to \$31 to \$33 per ton. Toilet papers have been rather quiet, as dealers and jobbers were anxious to dispose of their old stocks before the first of this month, when the Brooks content and container law became effective, and sold out at the best prices possible. Having no demand on hand at present, they have placed only a few small orders with mills. Cigarette papers are in good inquiry and prices are firm.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b. mill.

News, rolls, contract renewals, \$1.95 to \$2.00, f.o.b. mill.

News, sheet, \$2.25 to \$2.30 f.o.b. mill.

Book papers, car lots, C. & S. C., \$4.00 to \$4.50 f.o.b. mill.

Book papers, car lots, M.F.S., \$3.75 to \$3.90, f.o.b. mill.

Writing paper superfine, 13½c to 17c, del. east of Miss. River.

Writing paper, extra fine, 11c, del. east of the Miss. River.

Writing paper, No. 1, fine, 9c, del. east of the Miss. River.

Writing paper, No. 2, fine, 8c, del. east of the Miss. River.

Writing paper, engine sized, 4½c to 8c, del. east of the Miss. River.

Bond paper, 5c to 24c, delivered east of Mississippi River.

Ledger paper, 8c to 30c, delivered east of Mississippi River.

Linen paper, 7c to 1c8, delivered east of Mississippi River.

Manila jute, 4½c to 5½c, delivered.

Manila, wood, \$2.40 to \$3.00, delivered.

Kraft, No. 1, \$3.50 to \$3.75, f.o.b., mill.

Kraft, No. 2, \$3.25 to \$3.50, f.o.b., mill.

Boxboards, news, \$30 to \$33 per ton, delivered.

Boxboards, chip, \$28 to \$31 per ton, delivered.

Boxboards, straw, \$28 to \$31 per ton, delivered.

Wood pulp board, \$42.50 to \$45 per ton, delivered.

Tissue, white, cylinder, 42½c to 45c, delivered.

Tissue, fourdrinier, 47½c to 52½c, delivered.

Tissue, jute Manila, 42½c to 45c, delivered.

THE BRITISH MARKETS.

(Special to Pulp & Paper Magazine.)

London, Feb. 18, 1914.

The scarcity of new business during the close of 1913 has prevailed in the British paper industry right into the opening months of the present year. There is no hiding the fact that things are not at all satisfactory now from the mill owners point of view, and added to the dullness in business there is the great difficulty of extracting an extra charge on any class of papers to recoup the extra outlay imposed by the heavy cost of production and excessive transport charges. Agents as well as mill men are grumbling at the small demand for all papers and the export trade shows very little improvement. During January, British writing paper, printing paper, pasteboards, playing cards, envelopes, bags, etc. were exported to the extent of £332,538 (16,820 tons) as against £341,841 (16,147 tons) in January 1913. Newsprint and hangings fell off very considerably, whilst writing papers only advanced in the export returns to the extent of £5,000 compared with January 1913, and a decrease of £2,000 when compared with the same month in 1912. The figures for the Dominion

and U.S.A. are as follows:—To Canada: Writing paper 475 cwt., as against 459 cwt., in January 1913; newsprint and other printings, 6,853 cwt., a decline of 6,297 cwt.; unenumerated papers 336 cwt., compared with 178 cwt. To U.S.A.: Writing paper, 201 cwt., a decline of 25 cwt.; printing papers and newsprint, 3,780 cwt., as against 2,789 cwt.; unenumerated papers, 213 cwt., a decline of 87 cwt. compared with January 1913. These figures show that trade with Canada and the States has not been prosperous in January. Turning to the imports, Newfoundland has made a wonderful jump in the export trade to England. In January 1913 the mills in Newfoundland sent to England 17,140 cwt. of printing and writing paper on reels, whilst in January last the figures rose to 104,535 cwt. These imports beat all countries sending to the British market, and naturally the effect is keenly felt. The total imports from all places into England and Scotland, etc., reached 495,63 tons, valued at £631,043 compared with 49,514 tons valued at £611,699 in January 1913.

The dullness prevailing in the paper industry has caused a very limited demand for sulphite and sulphate. British mill men are not disposed to much business and from Scandinavia comes the report that if it was not for America, Norway and Sweden, mills would feel the turn of events very keenly. Quotations are now about as follows:

Sulphite bleached (No. 1)	\$57.60	to	\$60.00
Sulphite Easy Bleaching No. 1 . .	42.00	to	43.20
Sulphite news	38.40	to	39.40
Soda unbleached (No. 1)	38.45	to	40.80
Soda Kraft	38.00	to	38.60

All quotations c.i.f. British ports. During January chemical pulps were imported to the extent of 35,511 tons, compared with 33,262 tons in 1913. No supplies arrived from Canada. Sweden and Norway were the largest supplying countries.

The mechanical pulp market still keeps featureless, and very little business is passing. Hopes, however, are entertained that within a brief period the market will be changed, and sellers are looking forward to an improved demand. Prices are now firm, with a tendency to harden for prompt delivery. Quotations:—Pine 50 per cent moist (unwrapped) \$10.30 to \$10.75 Pine dry 20.40 to 30.20 For forward delivery add about half a dollar. All prices c.i.f. British ports. In January 40,000 tons of mechanical wet and dry pulp were imported into the British market, as compared with 42,906 tons in January, 1913. The countries supplying mechanical wet were: Sweden, 6,729 (compared with 713,218 in January 1913); Norway 29,807 tons (27,578 tons in January 1913); Canada 1,294 tons 307 tons in January 1913; other countries, 818 tons (compared with 1,027 tons).

The esparto trade is receiving a severe check owing to the extremely high prices that prevail at present. There is no active demand, and sellers are reserved and unwilling to offer freely. African prices are again advancing and are very firm.

The chemical and paper stock trades are fairly active, and values are unchanged since last report in the Pulp and Paper Magazine. China clay and other mineral fillings are dearer, and the supply is not equal to the demand.

SWEDISH MARKETS.

English buyers of Mechanical Wood Pulp are still holding back, unless they can get on at a very low price, and we learn to our surprise that some sales amounting to about 3,000 tons were made last and this week on a basis of only Kr. 33, including commission, for prompt shipment. The mills have probably wished to clear out their stocks to be prepared if the lock-out had become effective. Continental buyers, on the other hand, are slowly increasing their bids. Sellers seem generally to be of the opinion that the market for future delivery will probably harden and they are therefore not inclined to entertain low bids for contracts over the year.

America has purchased this fortnight many thousands of tons of Sulphite cellulose, mostly Strong, from the North of Sweden, but also some Easy Bleaching from Norway; the prices which have been obtained have been very satisfactory for sellers.

A contract for a couple of thousand tons of Strong Sulphate, also to America for delivery over the year, has likewise been made and full price has been paid. Owing to a scarcity of Esparto there is more inquiry for Sulphate pulp.

INTERNATIONAL PAPER.

Phillip T. Dodge, president of the International Paper Co. believes that the future of the concern lies largely in the development of its Canadian properties.

In a report to shareholders having regard to 1913 conditions, Mr. Dodge says—

"Net results were affected injuriously for a time, by the agitation and uncertainty due to the placing of news paper on the free list, the consequent fear that there would be a great influx of cheap foreign news paper, and the temporary reduction of prices by timid U.S. manufacturers to a point approaching the cost to manufacture.

"It was soon realized, however, that steadily increasing consumption of paper would, at an early day, demand the normal production of all existing mills in the U.S. and Canada, and justify the reasonable prices prevailing for the past two years. That the future growth of your company must be largely in the development of its Canadian properties is more a cause for concern to labor and the public generally than to you.

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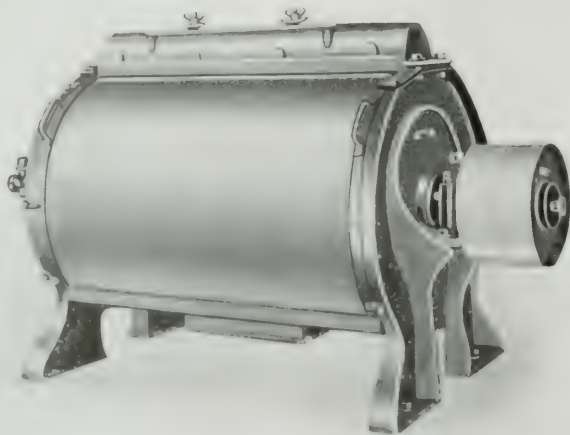
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A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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VOL. XII.

MONTREAL, MARCH 15, 1914

No. 6

A Canadian School of Paper Making

Great interest has been aroused in the United States by the address of Ralph H. McKee of the University of Maine, before the American Paper and Pulp Association in New York recently. Mr. McKee is attempting to interest the association in supporting the University of Maine in establishing a School of Papermaking. This is a most healthy step by the American Paper Industry and, coupled with this, the fact that McGill University has taken a similar step in this country, leads us to believe that something definite and of real benefit to the pulp and paper industry will soon result. The present method of developing a man to responsible positions by the path of promotion from "broke boy" is no longer sufficient to supply our important positions in the mills with suitable men. Most other large industries have met this need, which they felt, by such schools. The electrical industry, for example, has long enjoyed technical schools to draw from. The textile industry has also established trade schools, and we would not think of employing a physician who had obtained his training by starting as a young man in a doctor's office and with no more training than what he could pick up unaided. The pulp and paper industry has grown to such proportions that it requires skilled men to take the places in charge of the various departments of the mills. Some scheme of co-operation with the manufacturers, McGill University and Forest Products Laboratories could be worked out which could supply this need. It will be possible in Canada now to obtain from McGill University chemical engineers who have had considerable training in pulp and

paper making. They will there have the advantages of the experimental equipment of the Forest Products Laboratories, which is the best in the world and is being fitted up on an elaborate scale. But there is another problem which must be solved, that is, there should be afforded a school where it would be possible to get a one or two months' course at paper making, such as is given by Agricultural Colleges to the sons of farmers.

It looks now as though some solution of this problem was in sight by having a summer school in Montreal which would be under the direction of the new Forest Products Laboratories and would be held at the same time as the McGill Summer Schools. This would give the students an opportunity to take the necessary lectures with the engineering students, on those subjects which they require and spend a good deal of their time in practical laboratory work. This could be followed up by a few weeks in the paper mills nearest to Montreal under the charge of a suitable man. It is hoped that paper manufacturers will co-operate with this scheme in two or three ways. First, that they should take students in chemistry, mechanical, and chemical engineering during the summer holidays, paying them sufficient to meet their expenses. The exact nature of the work given them is of little importance. The important thing is to give them an opportunity to see how men and mill machinery are handled. It is possible to obtain such students at wages between \$50 and \$60 a month and it is always understood that the mills giving employment to these men in the summer have first chance to obtain them upon graduation. The first two weeks it is likely that the students will not fully earn his pay, but at the end of the first month

if he is not fully earning his pay, he should be fired, because he does not belong to the business. If manufacturers would co-operate with the above institutions, it is fairly certain that it will be possible to work a scheme which will meet a long felt need. We are far behind the older countries, many of whom have done considerable in this direction. Germany and Sweden have organized such schools and, to-day, practically every superintendent of a mill in these and other European States is a technical graduate.

France's school of papermaking, now one of the best, was not started until seven years ago, when the French Union of Papermakers subscribed the equipment and \$1,200 a year for running expenses. In 1913 their yearly subscription for running expenses was increased to \$6,000. In France there has been no question but that the benefit to the industry in these seven years has been many many times over the cost of this school. There is also a well equipped school of papermaking at the University of Manchester.

Let the Canadian Pulp and Paper Association and all manufacturers heartily co-operate with this movement.

News Print

A Montreal daily has sounded a timely warning in connection with the manufacture of news print paper in Canada. It points out that the newspaper industry is now benefitting by the new American tariff, and that many new Canadian mills are being established, and under contemplation, for the manufacture of news print, which will displace the older mills in United States. They are wrong in their figures, but there is no doubt but that the output will increase between fifty and sixty per cent in that time. They further suggest that our continuance in business is dependent upon American goodwill, and their keeping news on the free list. They also suggest that American news print manufacturers, are organizing against free trade in news print and will take action at the coming American elections. Canada will have built up within two years a large news print manufacturing industry, but we do not anticipate the sad calamities which the Montreal daily points out. It is true that a tariff against our product would have a bad effect on this industry, but we do not believe they will ever make the tariff sufficiently high to shut us out of their market. Looking at the situation as a whole, it would be practically impossible for the United States to shut Canadian news print out of their market. The suggestion that this will provide them a big club to hold over Canada in demanding tariff concessions is entirely wrong. We have a better club which is far more potent, that is, the prohibition of the export of our wood. As long as they admit free news print we would not be in a position to prohibit the export. But the minute that the United States excluded us from their market by an in-

surmountable tariff, we would, of course, have no other alternative but to prohibit the export of our wood to their mills. This would have the effect of raising enormously the price of wood in the United States, which would similarly raise the price of news print to a point where we could afford to pay the duty. The scare that Germans are landing news print on the sidewalks of New York two dollars less per ton than Canadians, is not well founded. We will never have any difficulty whatever in competing with German news print. We do not feel that there is any need to worry over our increasing shipments to the United States, except that possibilities do point to a rather too elaborate development in this line, and it would be well for those interested in new news mills to consider well their locations before finally deciding to build.

The Patent Office

An article in this issue by Mr. DeCew, the well-known engineer of Montreal, deals with a most pertinent subject in the pulp and paper world, that is, the Canadian Patent Office. The United States and Canada are both very far behind foreign countries in the administration and competence of our Patent Offices. Technical men are continually complaining of the gross injustice under which they suffer through inefficient staffs and red tape. It frequently takes years to have a patent completely put through, after a great deal of humbug. That this condition is of benefit to an industry which finds it necessary to operate under many patents is a gross misconception. To encourage development in our industries, we must encourage men with the technical training to develop new ideas and promote new processes. It is, of course, true that the name inventor is in disrepute. When a man appears calling himself an inventor, it is usually a sure sign that he is either a faker or, at least, is misguided. But there are those working in all industries for its advancement along technical lines who need protection and encouragement, and returns to such industries will be many fold, when such protection and encouragement is afforded. The days are past when a person can, by a patent, hold up the country and bleed the people. It is fair, of course, for any man, owning a new and useful process, to secure considerable benefit, but it is practically impossible in these days for such a man to perpetrate injustices on his fellows. There are still, of course, cases of extortion by men owning patents, but these are gradually being forced into the minority division. To benefit these conditions in Canada, at least, it seems to us that immediate action is necessary by the Government, in whatever means it may deem most advisable and efficient, to remedy the mistakes of this department at Ottawa. The chief difficulties with the present Patent Office are: First, the attorneys have not suitable facilities for search since there is no reliable index, and there are rumors that some attor-

neys have free access to the private documents; second, there are no printed copies of Canadian Patents available; third, the officer in charge of the Patent Office has neither legal nor technical training, and many of the examiners are grossly incompetent; fourth, secrecy of applications on file is not guarded as it should be. There have been cases when copies were lost; fifth, there is but one copy of files of Canadian patents and relative correspondence; sixth, one copy must be used by all searching for information. It is highly important that the Government should give investors honest treatment and fair protection.

CHEMICAL UTILIZATION OF SOUTHERN PINE WASTE.

The two articles by John S. Bates on this subject in the issues of January 15th and February 1st have aroused a good deal of favorable comment throughout the United States and Canada. The work upon which these articles was based was done in the Laboratory of Engineering Chemistry, Columbia University under the direction of Professor M. C. Whittaker, and not in the Research Laboratories of Arthur D. Little Inc., as the headings of these articles might be construed to state. Mr. Bates, however, is now a member of Mr. Little's staff, having been asked to associate himself with Mr. Little on account of the recognition of his very high value as an investigator in pulp and paper work. We feel sure that the articles have merited the large amount of comment they have brought, and that Mr. Bates is to be complimented on the process which shows such promising developments on an experimental scale.

EXPERIMENTAL BASALT LAVA BEATER ROLLS.

Arthur D. Little Incorporated, of Boston, Mass., who early in 1912 erected an experimental paper mill for the purpose of supplementing their chemical experiments with practical tests, have placed an order with J. Marx Co., of London, Eng., for a Basalt Lava Beater Roll to replace the steel roll, which is at present installed in their wooden Hollander, which has a capacity of about 50 lbs. of air dry stock. The dimensions of this new roll will be 18 in. face by 24 in. diameter.

This firm has also ordered a Crystalline Stone Press Roll for use on the first wet press of their 29 in. Four-drum machine. This press roll will replace their present roll, which is brass.

This Company deals in problems in pulp and paper mill operations and their order for the above equipment is in development with new processes and the conservation of fibrous products used by paper makers.

A number of the large Canadian mills have, for some time past, been using Basalt Lava Rolls with great success, but the above is one of the first installed for experimental work on this side, and Process Engineers Limited, of Montreal, who are the American representatives for J. Marx & Co., are extremely gratified to think that an organization such as this, which is headed by Arthur D. Little, a paper mill chemist of international reputation, who has been associated with pulp and paper mills since the earliest days of the sulphite process and whose organization consists of chemists and engineers of wide experience, have shown their interest and approval in this new departure in beating tackle, by placing an order with them.

The Agasotte Millboard Co., of Trenton, N.J., have also placed an order with the same firm for Marx Patent Single Beater for experimental work.

This beater will have a capacity of 40 lbs. of air dry stock and will be equipped with Basalt Lava Stone Beater Roll and stone Bedplates. This small experimental beater will contain all of the latest improvements.

The trough will be built of reinforced concrete, and will have a wide mid feather which serves to house the drive. The back fall is very high so as to permit a steep and continuous fall all the way down to the emptying valve. The bottom is curved and dished in such a manner as to insure quick mixing and uniform travel throughout the beater. The diameter of the roll is 24 in. and 18 in. on the face.

This miniature beater will be in all particulars similar to the commercial beaters as supplied by J. Marx & Co.

The roll will be fitted with counter balancing device enabling pressure of the roll to be regulated and varied at will. This counter balancing device is arranged with a graduated scale in such a way that similar beating effect can be repeated on similar furnishes by simply sliding the counter weight along to a given position.

The main feature of the Marx Beaters are, high speed of travel, reduced power consumption per ton of stuff, speedy and thorough mixing of the stock at high consistency, i.e., the Marx Beater works from 7½ to 10 per cent air-dry stock. Decrease in beating time, low maintenance costs, easy and convenient manipulation.

Mr. D. M. Sutherland, the Manager, of the Agasotte Millboard Co., will use this beater for experimental and research work. Whether the beater will be installed in Canada or the U.S. has not yet been decided.

Process Engineers, Limited, of Montreal, who are the Canadian representatives and sales agents for the Marx Beater, report that great interest is being taken by Paper and Pulp Manufacturers with reference to the various uses of Basalt Lava as a material for Beater Rolls. The discovery of its value for refining as well as for Beating has largely increased the demand for this material.

ACCIDENT IN BOOTH CAMP.

George Robeshean and Zevin Chock, two foreigners, who were seriously injured in a dynamite explosion, near Killarney, Ont., in one of the camps of the J. R. Booth lumber and paper firm of Ottawa, were brought to this city this week. Robeshean lost a leg in the explosion while Chock's skull was fractured. Accidents of this kind are comparatively rare in lumber camps.

PULP AND NEWS-PAPER MANUFACTURE

By J. STADLER, Shawinigan Falls, Que.

The subject of this paper is the power consumption in the manufacture of news-paper, and in the production of the fibre for the making of the paper, that is, the ground-wood and sulphite process.

The fibre used in the making of news-paper is produced entirely from wood. The wood used is principally spruce, hemlock and balsam. The other coniferous woods are used in smaller quantities.

News-paper is usually manufactured from 75% mechanical pulp (ground-wood) and 25% chemical pulp (sulphite pulp). Under ordinary conditions one cord of wood is required to make one ton of ground-wood, and two cords of wood are required to make one ton of sulphite pulp; hence for the production of news-paper one and a half cords of wood make 1.25 ton of news-paper made.

That Canada may be classified as a papermaking country can be seen from the following figures:—

	Daily Production	Production in tons per annum	Value of Product (Dollars)	Daily H.P. required per 24 hrs.
Mechanical Pulp	3,180 tons	800,000	12,400,000	210,000
Chemical Pulp	905 tons	272,000	10,336,000	7,500
News-paper	1,580 tons	480,000	18,240,000	20,000

In addition to the above, Canada is producing large quantities of chemical pulp made by the sulphate and the soda processes, from which paper is made under the classes of Kraft, packing, book and writing papers; these papers, however, will not be considered here.

From the above it will be seen that in the news-paper industry there is a daily output of 237,500 H.P., of which the principal amount is used in the production of mechanical pulp.

A number of ground-wood mills do not operate the entire year round to full capacity for lack of motive power.

The power requirements per ton of finished product may be taken as follows:—

Mechanical Pulp 1,200 to 1,920 H.P. hours=50 to 80 H.P. per 24 hours.

Sulphite Pulp 144 to 240 H.P. hours=6 to 10 H.P. per 24 hours.

News-paper 252 to 384 H.P. hours=10 5 to 16 H.P. per 24 hours.

The costs of plants are shown in diagram No. 1 and the figures are based on modern installations built to manufacture at lowest cost.

The writer is of the opinion that the heretofore prevailing custom of building plants for the paper industry with a view to low first cost will be discontinued as most plants do not manufacture

In the paper industry, like any other industry where motive power is used, constant speed is of importance, yet where a number of plants have been visited it is found that little has been done to provide this very important condition in the operation of the machinery employed. Investigations made have demonstrated that speed variations influence the quality and quantity produced to a very great extent and because of its easy application and constant speed, electric power is becoming more used in the news-paper and other industries.

Manufacturers of paper mill machinery should give more attention to the construction of machinery for direct connected electric drive, as generally the power required by the different machines is of such magnitude that small groups may be operated in such a manner very efficiently.

The Mechanical Pulp or Ground-wood Plant

It is only within the past few years that ground-wood pulp mills have been located remote from water power, and have used electrical energy for their operation.

In view of the large amount of power required, the location of such mills must be at places where low-priced power is available.

The ground-wood process may be briefly followed by referring to Diagram No. 2, in connection with the following table:—

Apparatus	Approx. H.P. hours required per ton		Approx. ratio of product to water	Performance of Apparatus
	Air	Dry Pulp		
A. Conveyors....	2 to 6			Delivering wood to plant
B. Grinder.....	1025 to 1596			Grinding solid wood to fibre
C. Coarse Screen..	3 to 6		1:350	Separating coarse slivers from fibre
D. Fine Screen....	36 to 60		1:350	Separating fine fibre from coarse fibre
E. Refiner.....	50 to 100		1:20	Reducing coarse fibre to fine fibre
F. Wet Machine...	30 to 50		1:3	Separating water from fine fibre
G. Pump.....	24 to 60		1:350	Lifting pulp and water to required height
H. Pump.....	20 to 40		.....	Lifting clear water to spray pipes
I. Cooler.....			.....	To absorb heat produced at "B"
Total.....	1200 to 1920 or from 50 to 80 H.P. per ton on 24 hr. power			

N.B.—Cooler is only given to show ideal installation in actual practice. Sufficient fresh water is supplied to keep temperature within desirable limits; the surplus water thus introduced in the process is generally permitted to run to waste, which quite often causes an appreciable loss of fine fibre.

The writer is of the opinion that in the future ground-wood mills will be especially constructed with a view to using power from large hydro-electric plants at such hours of the day as the load is low, in order to raise the load factor of the power plant.

The progress made in the past few years with automatic pulp grinders facilitates such an installation. In order, however, to keep the investment as low as practicable, the writer would propose to operate the auxiliary machinery of such a plant for twenty-four hours, and the grinders which absorb the bulk of the power for about 12 hours per day. Such a plant running only part of the year would not give steady employment to the help needed, and would, therefore, lead to inefficiency in operation. Such a ground-wood mill could, however, be operated in connection with a paper mill, where a steady power for practically the whole year round is essential. With this in view, the following has been prepared.

Reference to Diagram No. 2, of ground-wood process, shows that operation "A" requires 2 to 6 H.P. hours.

Operation "B" requires 1,035 to 1,596 H.P. hours.

Operation "C" to "H" inclusive requires 162.5 to 316 H.P. hours.

Estimating on the construction of a plant making 30,000 tons per year, based on 300 operating days, or 100 tons per day. Item "A" would be operated in daytime only. Item "B" at night only; Items "C" to "H" during 24 hours.

The electric power is assumed at \$16.00 per H.P., per annum, from 7 a.m. to 7 p.m.; at \$8.00 per H.P. from 7 p.m. to 7 a.m., which figures at 0.22 cents and 0.11 cents per horse-power hour respectively.

As an alternative, take a plant operating 24 hours, except Item "A," which is operated during the day only, at a fixed power cost of \$16.00 or 22 cents per horse power hour:

	No. 1 Full power, 12 h.			No. 2 24-hour power		
		per annum	per ton		per annum	per ton
6% interest on capital invested	\$450,000	\$27,000	80.90	\$300,000	\$18,000	80.60
10% depreciation on auxiliary equipment.....	100,000	10,000	33	100,000	10,000	33
6% depreciation on main equipment and buildings.	350,000	21,000	70	200,000	12,000	40
Day power at 22 cents per hour.....	100 H.P. hours		22	702.5 H.P. hours		1.55
Night power at 22 cents per hour.....				697.5 H.P. hours		1.53
Night power at 11 cents per hour.....	1,300 H.P. hours.....		1.43			
Total cost per ton.....			\$3.68			\$4.41

P.S. In the foregoing table it is assumed that 5 H.P. hours are required for "A"; 1,205 H.P. hours are required for "B"; 190 H.P. hours are required for "C" to "H."

The power requirements are taken low for a plant of that size, but any increase in power consumption would be more in favour of the low priced power.

It will be noticed that the plant No. 1 operates with about 830 H.P. load for 12 hours, and 10,800 H.P. for the other 12 hours, whereas plant No. 2 operates on a practically steady load of 5,850 H.P.

The resulting economy of plant No. 1 over No. 2 is 73 cents per ton on the power figures assumed. Pro rata computations can be made for any other power cost.

As already stated, the writer does not advise operating individual ground-wood plants for part of the year only. Such plants would become quite expensive, and the fixed charges per ton of product would be quite high; furthermore, ground-

wood depreciates in value with age, and such a plant would have to store large quantities of ground wood to supply the market as required.

Chemical Pulp Mill

There have been a number of mills located at places where no hydraulic power is available. Transportation facilities for the supply of materials used in the manufacture, and the marketing of the finished product, are also large factors in the location of a plant of this kind. The plant requires in addition to the two cords of wood per ton of pulp made, sulphur, coal, and lime, amounting in weight to over one-half a ton for each ton of pulp made.

The power requirements of the sulphite pulp process may be obtained by referring to Diagram No. 3, and to the following table:

Apparatus	Approx. H.P. hours required per ton	Performance of apparatus
A. Wood Conveyor	4 to 8	Delivering wood to plant
B. Chipper	16 to 24	Reducing blocks to small chips
C. Screen	1 to 2	Sorting wood chips
D. Chip Conveyor	3 to 6	Delivering chips to bin
E. Chip Bin . . . . .	.....	Storing wood chips
F. Digester . . . . .	.....	Reducing wood to pulp
G. Wash Tank . . . . .	.....	Washing pulp
H. Stock Tank	2 to 5	Storage of washed pulp
I. Circulating Pump	30 to 60	Lifting diluted pulp
J. Coarse Screen	1 to 3	Separating knots from fibre
K. Fine Screen	14 to 25	Separating fine from coarse fibre
L. Wet Machine	25 to 35	Separating water from pulp
M. Knot Reducer	(not considered)	Reducing knots, etc., to low grade pulp
N. Acid Making	48 to 72	Making and delivering acid to digester
	144 to 240	6.0 to 10 H.P. per 24 hours

From the first cost of such a plant as shown on Diagram No. 1 it is apparent that in view of the small amount of power required, no economy would be effected by using only restricted power.

Such an installation requires in addition to motive power, heat in the digester, shown in Diagram No. 3 under letter "F," where the wood chips are boiled in a solution of sulphurous acid, under about 80 lbs. steam pressure. The amount of heat required varies considerably, depending on the method employed in the working of the wood. While this demand is very irregular it is assumed in general practice that boiler capacity sufficient to deliver hourly 1,000 lbs. steam per ton capacity of plant per 24 hours is necessary. From this it will be seen that at a moderate price of coal the motive power required can be produced by a slight allowance in the capacity of the steam plant.

Large quantities of water are required in the manufacturing process, and the water should be comparatively clear as any impurities carried in it are likely to remain in the pulp and thus affect the value of the finished product.

The water consumption required for the water supply has not been considered and it would depend entirely on local conditions.

Paper Mill

In so far as the writer is aware, no news-paper mills have been built close to the point of consumption in Canada, but in countries which import the raw materials for the manufacture of paper, mills have been built in proximity to large towns. In Canada all the mills making news-paper produce their own ground-wood pulp, and quite a few of them also make their own sulphite pulp. There is a decided advantage in combining the three processes, viz.:—ground-wood, sulphite pulp and paper mill, while such a plan results in a somewhat lower first cost of the plant, its main economy is in the manipulation of the raw materials.

A news-paper mill may be located at any place having good transportation facilities for the supply of raw material and for disposing of the finished product. Since in this class of manufacture, a more highly skilled grade of labor is necessary than in the production of pulp, the location of the mill with reference thereto must also be considered, especially as a low efficiency of the labor may very much increase the cost of production.

The power requirements may be followed by referring to Diagram No. 4, and the following table:

Apparatus	Approx. H.P. hours per ton finished paper	Approx. ratio of product to water	Performance of apparatus
A. Beater or refiner	70 to 120	1:25 to 1:14	Preparing paper fibre
B. Stuff chest	3 to 5	..	Reservoir for paper fibre
C. Stuff pump	2.5 to 5	..	Pump to elevate same
D. Stuff screens	8 to 15	1:250	To remove impurities
E. Circulating pump	10 to 22	1:250	Circulate water used in formation
F. Vacuum pump	0.5 to 1.0		To remove water from paper web
G. Fourdrinier part	150 to 200	when leaving apparatus 1:7 to 1:2.3	Formation of paper web
H. Wet presses		Dry	Mechanical removal of water
I. Dryers		..	Thermic removal of water
J. Calenders		..	Polishing paper web
K. Reels		..	Reeling paper web
L. Rewinder	8 to 16	..	Cutting paper web

252 to 384 H.P. hours—10.5 to 16 H.P. for 24 hours

Power for items G to K is preferably supplied by the steam engine, using the exhaust steam in the dryers.

The dryers, item "I," require approximately 3 lbs. saturated steam at 0 to 10 pounds pressure per pound of paper made on the machine.

The steam engine driving the machine in a number of installations is made to drive all items above listed, except (A) the beater or refiner. By doing so, too much exhaust steam is generally produced, causing considerable waste of heat.

It is preferable to instal individual electric or group drives for all items except "G" to "K" inclusive. When the cost of motive power is low, there is some economy in driving all parts by electric motors, but it is very essential for the machine part proper (items "G" to "K" inclusive) to be connected to a circuit causing no variation of speed on the motors.

On machines operating at over 600 feet paper speed per minute, a sudden variation of one per cent. (1%) may cause the paper to break.

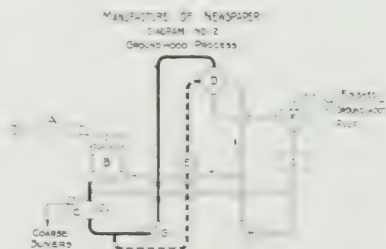
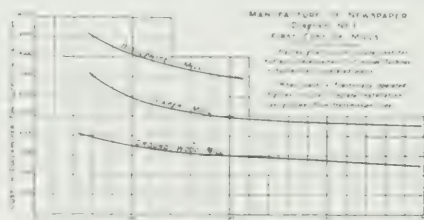
From the above it is apparent that a minimum 102 H.P. hours are required for the preparation of fibre and the driving of auxiliary apparatus in connection with the paper machine. Power requirements are, therefore, not so important a factor in the location of the paper but that preference may be given to close proximity to the market for the finished product.

The steam plant of the paper mill must be proportioned to take care of the large amount of heat required for ventilating the building. For every pound of paper made, about 2.3 pounds of water are removed from the paper web at the dryers, which is converted into vapor, and must be carried off by the ventilating system.

Considering the temperatures encountered in Canada, the amount of heat required for ventilating a paper machine building may at times be as much as eighty per cent. of the heat needed for drying the paper on the machine; the factors determining this are the temperature and relative humidity of the atmosphere.

Temperature has an appreciable effect on the manufacture of paper; large quantities of water are required in the process, and some of the water has to be raised to suitable temperatures in cold weather.

The water supply has also to be carefully considered in the location of paper mills, since there are employed various chemicals in the making of



the paper, and unless the chemical characteristics of the water are given due consideration, there may result a large waste from that source.

Of the power employed in the news-paper industry 84.4 per cent. is used in ground-wood mills, 8.4 per cent. in paper mills, and 3.2 per cent. in

sulphite mills. In the ground-wood mills 86 per cent. of the total power consumed is applied to grinding the wood, so that out of the total amount of power used in Canada in the manufacture of news-paper and its allied industries, 76 per cent. is used on the grinders.

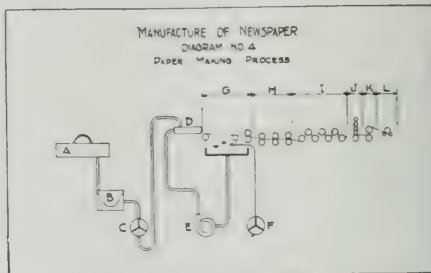
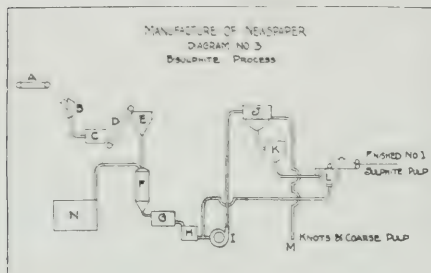
By referring to photograph No. 1, an idea may be formed of the general arrangement of the pulp grinders of the ordinary type.

Photographs Nos. 2 and 3 show an installation of two automatic grinders. The ordinary grinders are generally arranged in such a way that one man can feed the wood into two machines which produce from six to nine tons each in 24 hours.

The writer has given preference to automatic grinders, especially when they are electrically driven and in use for part of the day only.

Automatic grinders can be adjusted in such manner that practically no manual attention is necessary, and for this reason, the efficiency of such a machine should be considerably in excess of what can be obtained with the ordinary type of grinder.

By referring to photograph No. 3, which shows the charging end of an automatic grinder, it will be noted that the receptacle over the grinder contains a large quantity of wood and installations have



Pulp makers have usually believed that the speed at which the grinder operated was of no great consequence and that the determining factor was the pressure with which the wood was forced against the grindstone.

The writer has made numerous experiments, which have shown that with a grindstone running at a surface speed of from 3,200 to 3,500 feet per minute, the pressure may be varied within a large range without having any appreciable effect on the amount of fibre produced as long as the speed is kept reasonably constant. This also is confirmed by other experimenters.

A number of old plants are without speed control, and, as a result, of the fact that the operator who attends to the grinder will not feed regularly, the product necessarily varies considerably. To illustrate this point, reference will be made to the performance of an ordinary grinder which was operated by a hydraulic turbine and to the gate mechanism of which was attached a Bristol Mechanical Recorder. The speed of this turbine was kept constant by a governing device and the movement shown by the recorder represents the gate opening of the turbine which is nearly proportional to the power. The record is for a 24 hours run, and the shifts of operators were made at 7:00 a.m., 3:00 p.m., and 11:00 p.m., respectively. It will be noted that the best efficiency was obtained between 11:00 p.m. and 7:00 a.m., a fact which might be attributed to the work being done at night, but which was in reality due to the inexperience of the operator, who was a new man.

This effect is especially shown with a view to calling attention to the manual expertness of operators, and to point out how necessary it is that persons, even at this nature, be kept in operation the whole year in order that the operators may obtain a higher degree of efficiency.

been made where the wood supply in these automatic grinders lasts from 12 to 16 hours. Such machines are specially adapted for use when surplus electrical power is available at any time of the day. Actual operating results have shown that the amount of pulp produced per H.P. hour is from 10 to 20 per cent. in excess of what has been possible with the ordinary type of grinders; and the automatic machines have the further advantage that one skilled operator can supervise a number of them, the duty of the operator being only to see that the mechanism is kept in good working order.

In order to avoid misunderstanding, it should perhaps be stated that such devices for constant power consumption can be and are used on the ordinary grinder, and to repeat that so long as the placing of the wood to be ground depends upon the skill of the operator, the best results cannot be obtained.

Paper read before Canadian Society of Civil Engineers, March 5, 1914.

I. A. STANWOOD DEAD.

Mr. I. Augustus Stanwood, said to be the first man to manufacture paper by the wood pulp process, died on March 4, aged 75. He was born in August, Maine.

Mr. Stanwood entered the paper manufacturing business with his father at an early age. That was when paper was made from rags. The germs carried by the rags caused cholera.

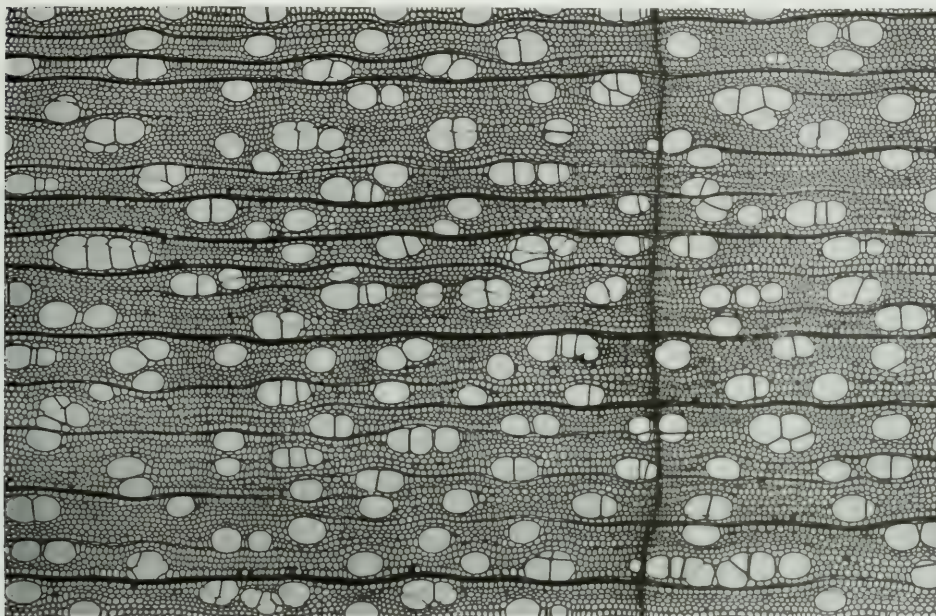
It was to remedy this that Mr. Stanwood started to experiment with wood as material for making paper. In January, 1863, not only had he produced wood paper, but was selling it to the trade.

Mr. Stanwood's attention in the experimental stages was called to the material used by hornets in making their nests, and its close resemblance to paper.

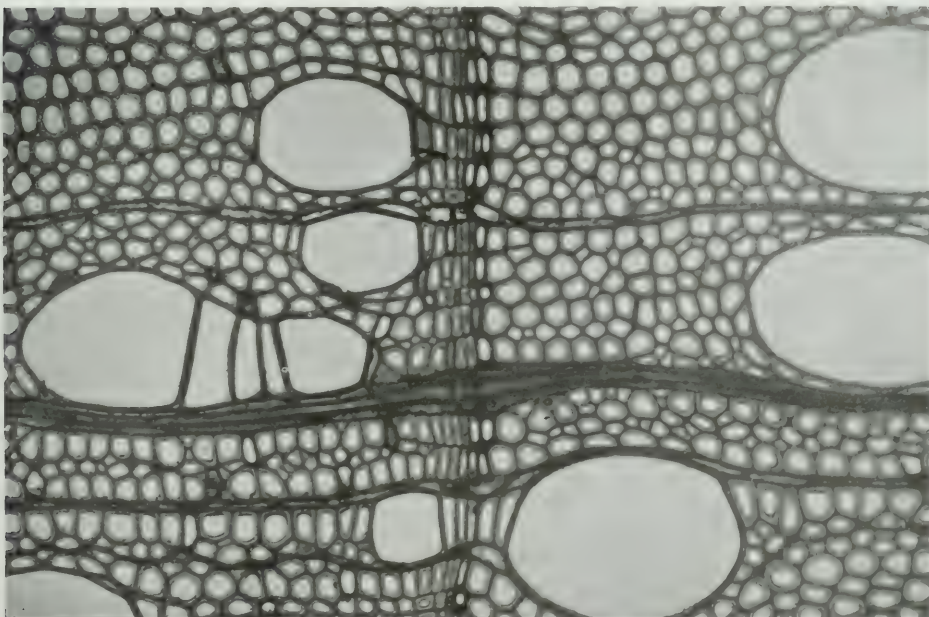
Micro. Photographs of Paper Making Woods--WHITE BIRCH

Made under the direction of H. D. TIEMANS, U.S. Forest Products Laboratory,
Madison, Wis.

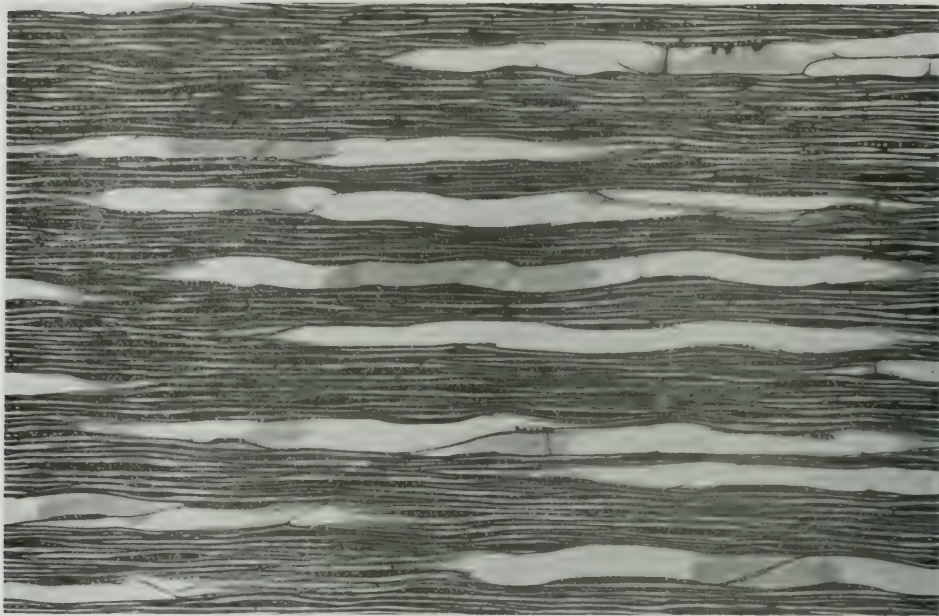
(Concluded from February 15 issue)



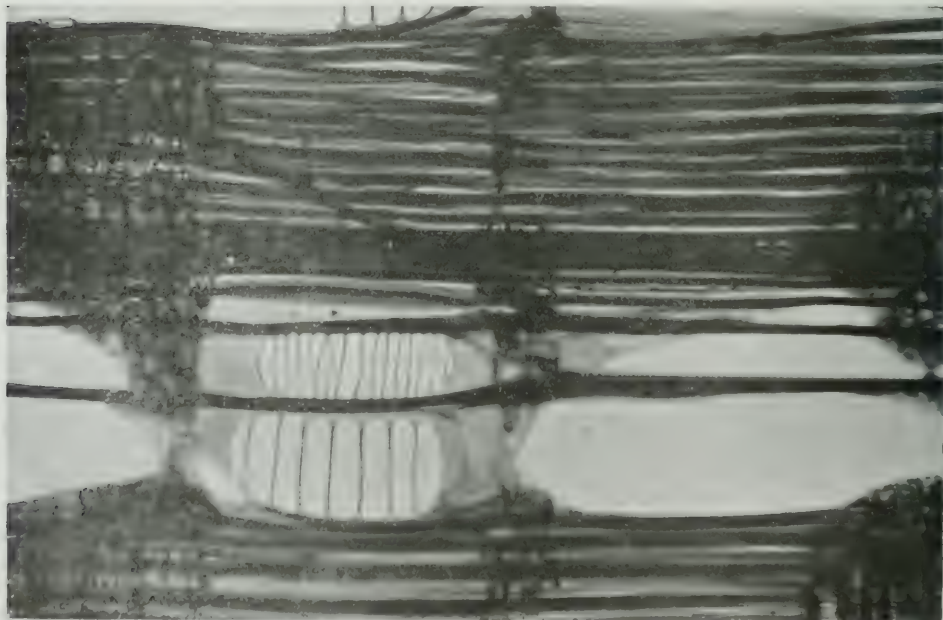
Betula Papyrifera—White Birch—Transverse $\times 50$.



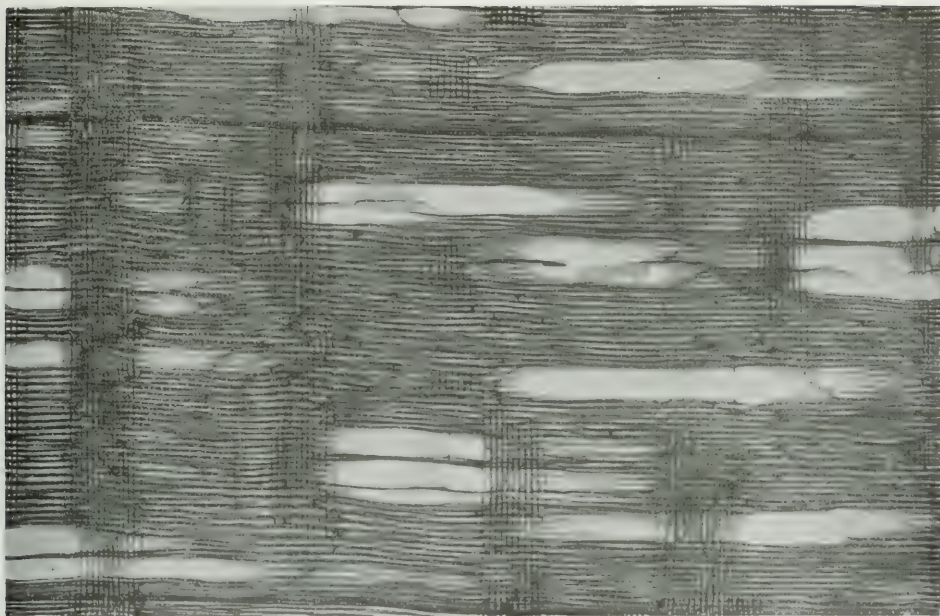
Betula Nigra—White Birch—Transverse $\times 250$.



Betula Papyrifera—White Birch—Tangential $\times 50$.



Betula Nigra—White Birch—Radial $\times 250$.



Betula Papyrifera—White Birch—Radial $\times 50$.

VACATION EMPLOYMENT FOR STUDENTS.

It is now nearing the time of year when college students, actuated either by solely ambitious reasons or from motives which may be ascribed as partly ambitious and partly born of dire necessity, begin to cast about for some profitable employment during the long vacation.

The custom is not so general now as it used to be for under-graduates of universities to seek work as waiters at fashionable summer resorts. The romance of the thing has worn down a bit and the associations could not have been altogether pleasant, for life in the servants' quarters of a busy hotel has little of the boating-tennis feature about it.

Now a new and a more profitable way of helping out between courses is beginning to present itself to industrious young college men. Large manufacturing concerns that employ chemists, engineers, draughtsmen and such like professional help, in many instances offer opportunities to the student to employ their spare time, if not profitably in a financial sense, at least to advantage, worth more in the end than wages.

We have before us a copy of a letter from the Republic Bag & Paper Company, addressed to Professor Ralph McKee, in charge of the pulp and paper department of the University of Maine. Professor McKee, it will be remembered, delivered an instructive address before the American Paper and Pulp Association on the training of young men for the manufacture of pulp and paper, in which he made an appeal to the paper manufacturers to provide more complete equipment for the institution which had undertaken the instruction of

young men in practical and theoretical paper making. The company is commending the efforts of the University of Maine, and particularly of Professor McKee, in the cause of a technical training for paper makers, offers to assist the institution in a practical way by finding employment for one or two students during the summer vacations, or from June 15 to September 1 each year, at a salary of \$50 per month. The promise is made with the understanding that the company is to have an option in the students' services for the first five years after graduation. The idea is to provide competent superintendents, and it is understood that if the student proves his ability he will quickly be advanced to this responsible post.

This is an example of what may be termed practical generosity, meant to benefit alike the university, the students and the manufacturing employer.

No doubt the example so set will be followed by similar offers, and practical training at the mills will become a regular feature of the college course, so that while the student will be gathering knowledge in return for services, he will also be earning enough to support himself during the summer months. In response to an inquiry we are informed by Mr. J. L. Wilson, of the engineering department of the General Electric Company, that it has been the custom of the company to employ one or two college students on construction work during vacation season, and usually to pay them \$10 per week or more, according to ability.

This is naturally as it should be for the benefit of all concerned, and we trust to see the practice become general among the paper mills within the near future.—Paper Trade Journal.

ELECTRIC DRIVE IN PULP AND PAPER MILLS

By **W. L. MERRILL.**

P. & M. Engineering Department, General Electric Company.

In discussing the question of electric power in pulp and paper mills, it is unnecessary to go into the advantages of electric drive over other methods. The fact that the paper industry is, I believe, second (textile first) among our major industries to recognize its advantages on what might be termed a wholesale basis would seem to prove this. It has been building new mills and re-equipping old ones with electric drive ever since. An estimate of the amount of electric power used in the United States in this industry is probably in excess of 200,000 h.p.

The developmental history of the electrification of paper mills is essentially the same as in the other major industries. That is, the first few installations which were made were simply replacing some of the main drives by single motors, using the group drive system throughout; that of course giving a small number of motors of comparatively large capacity. This method was also followed in the building of the first new mills electrically driven. Gradually, as the flexibility and convenience of the drive was recognized, the group system to an extent became eliminated and special drives were gotten out for individual machines, such as jordan beaters, and the like, until at the present time in a new installation most of the machinery has its individual motors.

The machinery manufacturers for this industry have in the past been somewhat slower to take advantage of a combined motor and machine design than in some of the other industries; preferring to supply the old standard lines, leaving the application of the motor drive to be made as best it could. This condition is now somewhat changed, and a number of combined machines are on the market. Still there are many more machines yet to be studied by the machinery and electrical manufacturers with a view to bringing out a more efficient combined unit than a combination of the two existing standards.

To digress a little, who would have dared predict fifteen or eighteen years ago that it would be possible to buy in the open market, combination stock machine tools? Such, however, is the case and it is now possible to purchase machine tools from the largest planters with a one hundred horse-power reversing main motor drive with several auxiliary motor drives without a single belt, down to a $\frac{1}{4}$ horse-power motor driven every wheel. In many cases the tool and motor are designed for each other, and all common parts eliminated, the motor forming a part of the tool or vice versa.

Drive.

In dealing with the subject of drives, I shall try to point out some of the methods and the advantageous ways of grouping the drives which experience has shown to give the best results.

No hard and fast rules can be laid down by any engineer as to whether individual or group drive, the selection of frequency, voltage, etc., can be followed, but each case must be treated on its own merits. This naturally divides itself into two distinct classes, namely, the electrification of an existing mill and the electrification of a new mill.

The New Mill.

In general, the drives for a new mill will naturally be along the lines of individual drive, the saving in first cost of belts, shafting, hangers, etc., more favorable location of the machinery and safety of employees will go a long way to offset the increased cost of the larger number of smaller motors. Parts of the mill where this is questionable, or at least should be carefully analyzed, are the wood room, rag room, cutter room, etc. I predict that in the near future individual drive will be universally used, even for these, as good examples are now available even in some of these departments.

The Old Mill.

In the electrification of existing machinery, the results do not always warrant the cost, and group drive is still and should be used, since the changes in the mill machinery itself for the adapting of individual drive are often expensive. This is particularly true in the case of centrifugal pumps. However, when extensive changes are being made in a mill where pumps of many years' service are installed it is often more economical to scrap these and purchase modern high efficiency pumps individually driven by their own motors. This is a question of investigation in each case.

Choice of Current.

There is, with the exception of one or two cases, no excuse for installing direct current in a paper mill, unless of course it is merely a matter of a small extension to an existing plant. The particular nature of the loads and the continuous service, and in most cases constant speed, lead to the adoption of alternating current. While direct current installations may prove in a measure satisfactory, I have yet to see any arguments or conditions which would warrant direct current installations on a wholesale basis. The cases where direct current should be used I consider are limited to the following:

In case of driving the paper machines by motors, it becomes necessary to use direct current, if any large amount of speed variation is desired. There are also some advantages in using direct current in a finishing plant where practically all of the load is super-calenders. A single direct current motor is somewhat simpler than a two motor a.c. drive, but even here, if the cost of the power plant is to be considered, it will probably be found in favor of the a.c. when the present or ultimate requirements exceed 500 kw.

Grinder Drives.

Perhaps one of the most recent developments which is attracting attention at the present time is the electrically driven grinder. Until a comparatively few years ago it had usually been supposed that the only economical way to grind wood was by water power direct. Certain factors have now entered into this operation which make it not only feasible but desirable to drive grinders by motors under certain conditions; first, it allows the development of several water powers in close proximity to the mill to be electrically developed and used in one place, second, there are a great many power companies throughout the country

who are desirous of obtaining contracts for large blocks of power during certain hours of the day and many times continuous throughout the day at such attractive rates that it not only becomes a feasible but a paying investment to install motor-driven grinder equipments. For example, assuming a mill in which all the ground wood is used for making paper, the normal method used to be to run all of the stock over wet machines, using laps either directly in the beaters or storing them for future use. This usually necessitated an installation of grinders in excess of the normal demand of the paper machines so that pulp could be stored during high water and used during the low water. This, of course, is an added investment and also a labor expense in running the lap machines, handling the pulp to storage, again to the beater room, and last but not least, extra power for beating laps. Now, by the use of

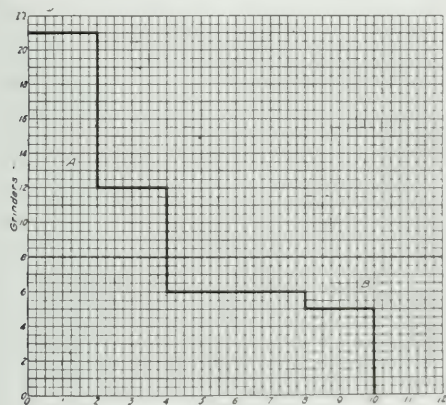


Fig. 1

the noodle machines and a favorable contract for power, the grinder room can be run at just the capacity to take care of the requirements of the paper machines. And with the installation of a few wet machines it is usually possible to gradually accumulate a moderate supply of lap pulp and sell to the other fellow during low water periods at a good margin of profit. This constant supply of ground wood in the slush form is where the electric drive can be used to advantage in many mills. For example, with assumed conditions as shown in Fig. 1, the demand of the paper mill machinery would require eight grinders running continuously.

In such an installation we will assume that there were twenty-one grinders installed and water for the total number in an average year might be available for two months. Two months it would be possible to run twelve grinders; four months of the year, six grinders; two months of the year, two grinders; the remaining two months, none. Under the original process it may easily be seen that the wood ground represented by area (A) has to make up the deficiency for the low water period (B). In this case we have a total of one hundred grinder months during the year.

Assuming 300 h.p. per stone, two 1,200 h.p. motors each driving four stones and purchase power available, the following savings would be realized.

Maintenance on excess grinders, head gates, pen stocks, wheels, etc.; extra power necessary to run at the lap machines, less power and time in the beater

room; the cost of one attendant per lap machine; the cost of transporting the pulp to storage, piling it, bringing it back to the beaters; shrinkage and waste due to handling and storage. Against this saving we would have the added investment of the two motors, the power to drive the deckers (which is negligible) and centrifugal stock pumps.

Second example: Assume a stream flow as shown by Fig. 2, eighteen grinders two months, twelve grinders three months, six grinders five months, four grinders three months, making a total of 102 grinder months. Under this condition one 1,200 h.p. motor driving four grinders, in addition to the four grinders which can be run all of the year by water power direct, would give an even flow of stock for the machine room, with practically the same savings as noted before.

In either of the above curves it will be possible at slight expense as far as power is concerned to materially increase the size of the mill, as one or two of the wheels originally used for driving excess grinders could be equipped with generators and motors applied to the additional machinery. During the low water period, power could be bought in larger quantities from the central station.

Another advantage in electrically-driven grinders and purchased power is the fact that during low water periods the price of pulp is usually much higher than at average high water periods. It might therefore be possible by the installation of a few wet machines, or retaining some of those already installed, to run some of the product during the time of peak prices over the wet machines, shut down one paper machine, and place the pulp on the market instead of using it in the mill.

In the case of large installation of motor-driven grinders, increased production can be obtained by installing one or two smaller motors at a speed, say, of 300 to 325, so that when the stones wear down in the slower speed drive they can be transferred to the higher speed motor and the production again brought up to approximately that of a new stone. This is also feasible in the case of a water power installation where there are several stones on a shaft, usually of varying diameters,

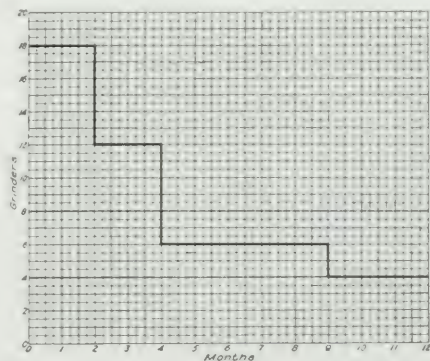


Fig. 2

the smaller stones can be taken out and replaced by full sized stones, the smaller ones being transferred to a motor of higher speed for this service. In the original grinder installations there seems to be a great deal of trouble incurred by the insistence of the operators in slowing down the stones for sharpening. I believe it is now practically universal to sharpen the stones at

full speed. There is one precaution that should be taken in a modernized grinds installation, that is, in arranging to turn for balancing the stone before it is placed in service as, if no arrangements are made in the driving equipment for slowing down for this process, a stone out of balance brought up to motor speed might give serious results. The lathe for doing this work, however, is inexpensive.

Power Requirements for Paper Machines.

It is not the purpose of this paper to discuss the amount of power necessary to drive paper machinery, but I have data for power to drive paper machines which may be of some value in approximately estimating the power necessary to drive various machines and is taken from very accurate and authentic tests of about thirty machines on various classes of stock and running at various speeds.

An analysis of the test tabulated shows that in most of the Fourdrinier and single cylinder machines the power required to operate the entire machine (including both constant and variable speed ends) is in the neighborhood of 0.004 to 0.0045 horse-power, per inch width, for each foot of speed of the paper. While it is theoretically incorrect to express the power required in this way because the total power taken by any machine is made up of two components, one (that for the constant speed end) being practically constant for all speeds, and the other, variable speed end, being about in proportion to the speed, nevertheless it appears from the test results that the formula, h.p. 0.004 to $0.0045 \times \text{width in in.} \times \text{speed in ft. per min.}$, give a fairly good check on the power requirements of a machine, the result when applied to a variable speed machine being possibly a little lower at the low speeds, and a little higher than the actual power at the high speeds.

The power required for the variable speed end alone runs from about 0.0023 to about 0.003 h.p. per inch width, per foot per minute speed.

For multi-cylinder board machines, the power is very much higher, ranging from 0.012 to 0.015 h.p. per inch per foot per minute for the entire machine, and from 0.0069 to 0.0088 h.p. per inch per foot per minute for the variable speed end alone. These figures, as previously mentioned, are in actual brake horse-power, and should be increased by about 10 per cent when comparing with tests of indicated horse-power.

This data is based on machines after they have been in service long enough to be worked down and in normal condition.

Electric Drive for Paper Machines.

A number of methods have been employed with success to date:

1) Constant speed motor driving both constant and variable speed ends of machine, with mechanical speed change between motor and variable speed shaft. This is the accepted installation, as for as electrical equipment is concerned, but does not eliminate the speed change which, especially in the case of large machines, may prove troublesome, besides having a first cost that may actually offset the initial saving in the electrical equipment.

2) Constant speed motor driving both constant and variable speed ends of machine. Speed regulation obtained by changing pulleys driving variable shaft. This is the second method used, but does not give any first cost advantage, and requires considerable time to

change pulleys. It should be used only in cases where it is expected to run on one grade of paper for long periods. It has been used in connection with new machines, which are usually operated at lower speed during the first few weeks or months of operation, than after they have been "broken in."

3) Constant speed motor driving constant speed end and slip ring induction motor with regulating resistance driving variable speed end. This method is only applicable when the amount of speed variation is very small on the variable speed end on account of the poor speed regulation at lower speeds. Just what variation is practicable has not been definitely demonstrated and probably varies with different grades of paper,

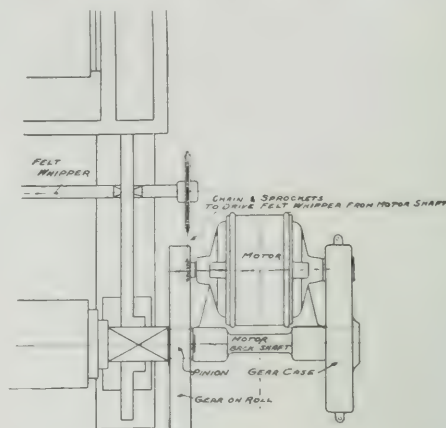


FIG. 1

but I do know that such installations have proven unsuccessful and trouble has occurred with a speed variation, 20 per cent in the case of tissue paper machines; but in cases where this drive is used I would not recommend that an attempt be made to reduce the speed much other 10 per cent.

4) Constant speed motor on constant end; adjustable speed direct current motor, field control on variable speed end. Since most paper mills use alternating current for their principal drives, this scheme requires a motor generator set for supplying the necessary direct current for the adjustable speed motors. The range for which it is economically possible to obtain adjustable speed motors. This limiting range is about four to one, and it is preferable to confine it to three to one. While it would be possible to build motors with a larger range, their cost and operating characteristics would not be favorable. It is sometimes possible to combine an adjustable speed motor with one or two pulley changes, and obtain a higher range economically. For example, if a machine ordinarily operates between 75 and 200 feet per minute, but on rare occasions is required to run at 40 or 50 feet, it might prove most economical to install a 3 to 1 motor with an extra pulley, all ordinary speeds being taken care of by field control, and the extremely low speeds by using the smaller pulley. Installations of this type have been made, in which two pulleys were mounted permanently, side by side, on the motor shaft with corresponding pulleys on the back shaft of machine. The change of the belt from one set of pulleys to the other can be made in a comparatively short time when a speed is desired

which cannot be obtained with the particular pulley ratio in use. This scheme requires the use of a three-bearing motor.

(5) Constant speed motor on constant end; speed variation of motor driving variable speed end being obtained by voltage control. This is the system commonly known as Ward Leonard control. It requires a separate generator for each machine as well as an exciter for exciting the fields of both the generator and motor, but is the only practicable scheme (except a modified form which will be described later), for obtaining speed ranges of 5 or 6 to 1 and greater, by purely electrical means, i.e., without the use of auxiliary mechanical devices, such as the step pulleys, etc. The generator for supplying direct current for the variable speed motor is usually driven by an induction motor. If several machines are involved, it would be possible to combine the generators in one set with a common driving motor and exciter for all, or at least for two of them. It is also possible to omit the motor, driving the constant speed end of the paper machine, and drive this from a pulley on the motor generator set, making the motor of this set large enough to drive both the constant speed end and the generator supplying the power for the motor driving the variable end.

(6) Another arrangement consists of an engine of sufficient capacity to drive the constant speed end of the machine direct or by pulley, and direct connected to a direct current generator on the other side of the engine. The variable speed end is then driven by a motor receiving its power from the generator by the Ward Leonard system. This seems to me to be a very economical and applicable drive.

(7) Still another combination which has been used with success is the driving of a generator by a non-condensing turbine or engine, driving the variable speed end by direct current motor and the constant speed end by a constant speed motor.

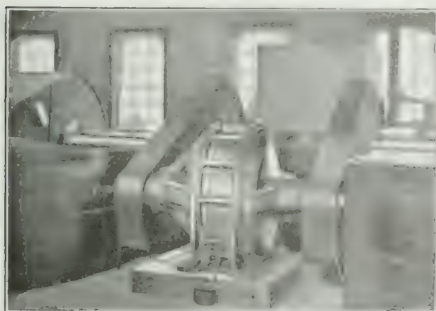


FIG. 4
150 H.P. Induction Motor Driving Two Beaters through shaft Chains

In any system of motor generator control where speed variations of more than, say 1 to 1 are required, they are best arranged by having a certain amount of speed control within the motor itself. Since the torque curve of the variable speed end of a machine deviates somewhat from the constant torque line, taking more power per revolution at low speeds and less power per revolution at high speeds, the current necessary between the motor and the generator is more at low speeds than at high speeds. The ventilation of the

motor, of course, is less at low speeds. By a combination of the Ward Leonard system and field control of the motor, lower first cost equipments can be installed and give better operating characteristics.

Sectional Drive of Paper Machines.

Sectional drive of paper machines is perfectly possible and feasible. Some experimental installations have been made with more or less success. I believe, however, that the time is not ripe for the wholesale adoption of this method of drive and that we are at the present time in this respect about where we were ten of fifteen years ago in the electrification of the whole mill, i.e., group drive. As the mechanical and electrical arts progress, eventually sectional drive will become the standard, although it may be ten or it may be twenty years.

Appendix.

Different types of motors have been developed for various service conditions and each type has its distinctive field. Alternating current motors are generally divided into the following classes:

- A. Squirrel cage.
- B. Internal resistance type.
- C. Collector ring type with external resistance.
- D. Synchronous motors.

A—Squirrel Cage Type or Motor.

The squirrel cage type of motor is essentially a constant speed motor and the speed cannot be appreciably changed. This type of motor has high starting torque, high efficiency, and high power-factor. In the larger sizes it is customary to use compensators for reducing the voltage applied to the motor at the time of starting. This is not to protect the motor but to avoid heavy fluctuations on the line. It will, therefore, be seen that squirrel cage motors should not be used; first, where speed reduction is required; second, where at the time of starting it is desired to start slowly or to "jog" the load; third, where sudden shocks are objectionable at the time of starting, such as in the chain drive on beaters. In group drives where belts are used, these shocks are absorbed by the belts and are not objectionable.

B—Internal Resistance Motors.

The internal resistance motor has high starting torque, high efficiency, and high power-factor, similar to the squirrel cage and has the advantage of being able to gradually increase the speed of the motor until the necessary speed is reached and is satisfactory for service where the load has small inertia or is practically all motor and the time of acceleration does not exceed about one minute. The internal resistance, however, cannot be made large enough to give any speed regulation and the motor must be treated as a constant speed machine. This motor is satisfactory for group drives of average service conditions, such as screen rooms, sulphate departments, etc.

C—Collector Ring Type of Motor.

The collector ring type of motor has a high torque, high power-factor, and efficiency somewhat lower than the above two types. It may be either constant speed or varying speed. As a constant speed motor it should be used where heavy starting duty is required, since it is possible to proportion the external resistances used in connection with a drum controller to meet almost

TYPES OF MOTORS (SEE APPENDIX)

A—Squirrel Cage; B—Internal Resistance; C—Collector Ring; D—Synchronous.

Machine	Type of Motor for Individual Drive	Connections	Remarks
Grinder lines	C or D	Direct connect through flexible coupling	In case of single stone a higher speed motor may be used with rope drive
Flat bed screens			Groups of several lines use B or C or D. Individual line use A with gear or chain
Rotary screens			Little power required—can be arranged for individual drive
Centrifugal screens	A	Belt to pulley on top or pulley on bevel gear shaft	Can be arranged for direct connection to vertical motor or to horizontal motor through the bevel gear
Sliver screens	A	Belt or gear	When group driven they are usually connected to a main group of machines
Circular saws	A, B or C	Belt	
Band saws	C (with enclosed collector rings)	Direct connect through flexible coupling	
Small conveyors	C	One belt in the reduction (for mechanical protection)	Belt can slip in case of clogging. Starting resistance should be liberal for slow starting and breaking loose
Heavy conveyors and log hauls	C	Same as for small conveyors	Same as for small conveyors
Chippers	C	Belt	A combination design is feasible for direct connection
Barkers	A	Direct connected	
Jordans, Marshalls and Claffins	A, B, C or D	Direct connected through flexible coupling—sliding motor or telescoping coupling	New type Marshall has adjustable shell. Drive through solid coupling or flexible coupling
Beaters and washers	C (see Fig. 3)	Chain or belt	Usually driven in pairs from one motor (see Fig. 3). Chain should be amply large. With belt drive, motor may be in basement. Liberal starting resistance needed in any case
Wet machines	C	Gear	Fig. 3 shows suggested arrangement with chain drive to whipper from motor shaft. C used to give slow speed for adjusting felt
Deckers		Belt	Group drive by A or B on account of low power and speed
Super calenders	Direct current special or alt. cur. small motor A	Gear	Direct current motor has field and shunted armature control
Sheet calenders	Large motor C	Gear and clutch	
Platers	A	Gear	Group drive usual on account of uniform speed.
Pumps	A or B	Gear	Individual drive has operating advantages
Agitators	A or B	Solid coupling direct connected	Combination individual drive now available
Shredders	A or C	Belts and gears	Slow speed and small power. Usually driven from some other group of machines
Rag cutters, dusters, and threshers	A	Belted or direct connected	A or C motors according to size. A motors should have high torque rotors. C motors with ample starting resistance
Rotary boilers	A	Belt or gear	A motor is preferable for individual or group drive where power conditions permit, on account of amount of dust
Rotary furnaces	A	Gears	
Rotary cutters	A with mechanical speed change or adjustable d-c.	Gears or gears and belt	Many of these machines can be purchased equipped with motors
Vertical cutters	A	Gear or belt	Many types on market ready equipped with motors

any condition of starting required. With liberal resistance gears, several successive starts can be made without injury to the motor or controlling appliances, such as breaking a wood conveyor loose when jammed with logs or the starting beaters after the stock has settled. A squirrel-cage motor under similar conditions starts injures the conveyor or pump the roll out of its bearings. As a synchronous motor it can be used where a certain amount of speed regulation is required, provided it be not objectionable to have the speed change in the load changes, e.g., cranes, hoists, etc. If a set of lines is to drive where constant speed is desired in different loads with one setting of the controller, as the load decreases the speed increases, and vice versa.

D—Synchronous Motors.

Synchronous motors have low starting torque as compared with the above types, high efficiency, and an adjustable power-factor and can be often used advantageously for improving the power-factor of the system. Before installing a synchronous motor, however, conditions of operation should be thoroughly studied as many times the cause of low power-factor is due to many motors on the system running at partial loads.

Synchronous motors should not be installed on line shafting or individual machines where a heavy starting torque is necessary, unless they are provided with clutches or some means of relieving the load at the time of starting. The starting torque, in general, is

limited to about 30 per cent full load running torque. The synchronous motor can be used to advantage to supply auxiliary power to a line shaft already driven by a waterwheel or an engine, power being obtained from another station.

The synchronous motor also has a field in the industry in connection with low pressure turbines. Where there are one or two reciprocating engines, it is often advantageous to install a low pressure turbine and supply power to various motors throughout the mill; also to "pump back" on the engine or main line shafting with the synchronous motor. A combination of the engine or turbine and the synchronous motor is self-regulating.

Drives in General.

It is undoubtedly needless to call attention to the desirability of having all transmitting parts, such as belts, rope drives, gears and chains of ample proportion throughout the mill. Large motors which are to run continuously on heavy work with bedding under severe conditions should be equipped with three bearings; while two bearing motors under these conditions have in many cases proven successful, yet the occasional renewal of the bearing linings *more than warrants* the added expense of the three bearing installation.

Silent Chains.

Silent chain drives particularly should be of liberal size for the work they are to do. This is true of beaters where continued such shocks are apt to come on the chain. Read before American Paper and Pulp Association.

Brompton Adds News Mill

The Brompton Pulp and Paper Co., East Angus, Que., has decided to go into newsprint manufacture, and on Wednesday placed an order for a new Harrie Foundation



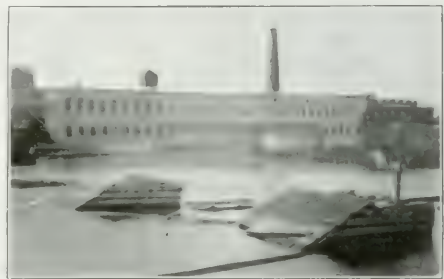
J. A. BOTHWELL.
Brompton Pulp & Paper Company.

ier, 160 inches wide. The machine will have a 75-foot wire and will be equipped, it is said with a Marx Margat Suction roll, and granite press rolls. They have also placed orders with J. A. DeCew, of Montreal, for a full equipment of Marx double beaters—a lava stone roll and a steel roll.

The new machine room will be built just at the end of the present beater room and kraft machine room, and will provide for the addition of a second machine.

Mr. J. A. Bothwell is to be congratulated on the changes he has made in the old plant of the Royal Paper Mills. Practically the entire plant, except the soda mill have been entirely rebuilt since he took charge. In addition to this he has built a mill up the river—one of the finest and most efficient ground wood mills in Canada. Mr. C. A. Ring, the engineer, has designed all the additions and new developments.

The Brompton Pulp and Paper Co. have two ground wood mills, one at Brompton and one at East Angus, Que. The depression in the ground wood market has



Brompton Pulp & Paper Co., East Angus, Que.—
Machine Room.

led them to install the news machine, and sell paper instead of pulp. It would be far better for this country if, instead of rushing to build too many new mills, we converted some of our pulp mills into paper mills. The Brompton kraft paper has long been famous, and with the use of the double beaters there is no doubt they will manufacture one of the best news sheets in Canada.

HOWARD SMITH PAPER CO. TO CHANGE NAME.

The Howard Smith Paper Company, Ltd., has given notice that it has obtained letters patent authorizing it to change its name to the Paper Industries Company, Ltd.

W. C. E. Koch, who is a well known lumberman and pulp wood operator in British Columbia, has built a big flume on Robson Creek, which will take six million feet of logs down the Skeena river this spring. The problem of getting timber from hitherto inaccessible sections of the mountains will thus be solved.

The Relation of Inventions and Patent Laws to Our Industrial Progress

By J. A. DeCEW, Chemical Engineer, Montreal, Que.

During the past few years there have been agitations, discussions and criticisms in the U. S. in connection with the Patent Laws and their influence in the development or control in industrial life.

It is not with the idea of offering a solution to any of the problems connected with patent rights that the following is submitted, but the relationship of Canadian Patents to our industries is one which we should find of interest and perhaps many of the facts relating to Canadian conditions, are not generally known.

When the investigator in some special field has at last arrived at an improvement, either in method or product, which is valuable to the world, he is offered, in consideration for the knowledge which he reveals to the public, a limited monopoly or right, to the idea or product, for a definite period of years, but in some countries there are conditions or restrictions definitely laid down in each case.

Were it not for the protection a patent gives, there would be a small inducement for any skilled artisan to spend time, thought and money in improving an art, but if such improvement were made, he would keep his knowledge a secret as long as possible.

In the history of the industrial life of various countries, this has been shown to be the case and those countries which provided none, or insufficient protection for intellectual property, were unable to make any improvements in manufacturing industries.

The status of the progress of the manufactures in a country may be judged by the proportion of protection of good faith this country offers to the inventive faculties of the artisan.

Wonderful industrial developments in Germany and the U. S. has been attributed directly to their excellent patent systems which, although perhaps far from perfect, are still greatly in advance of other countries.

In a country like Canada which has an abundance of raw material for manufacturing purposes and only lacks capital and proper methods of exploitation to create the wealth which potentially exists, there are great possibilities for further developments, if the right conditions are available. In many respects our industries are limited to the market, which we are able to provide by population, but given an excess of raw material and the best known methods of production, there is no limit to the market which is obtainable.

The paper trade is a special case of this kind where the latest methods, combined with the most valuable material of the best quality, have resulted in an enormous profit trade, and a great wealth producing industry.

In order to secure that Canada may keep to the front, and that our own develop improved methods of production simultaneously with other countries, it is desirable, that the best and greatest ideas in any line should be introduced into our industrial methods as soon as possible.

In order to obtain this it is necessary that inventors in different foreign countries, they may live and develop their ideas should be induced to take our patents in Canada and spend the time and effort on introducing some, bringing them to public attention.

Unfortunately for our general advantage many inventors do not take Canadian Patents and many who do, allow them to become invalid at the end of two years. This is because they must manufacture in Canada within two years or register under the compulsory license Clause No. 44, which greatly restricts the value of the Patent.

Our laws are doubtless framed with the best intentions on the part of our Legislatures and are conceived to be in the best interest of the country, but matters such as this do not always work out in the way intended. If an invention is of considerable importance, it would be several years before the inventor could establish it successfully in his own country, for the greater the advance in the art, the more opposition may come to his improvement from vested interests. The inertia to be overcome requires considerable money and energy before the new idea can be established and unless the inventor happens to live in Canada it cannot be expected that he will be able to concentrate attention upon our market until after he has obtained success elsewhere.

We tell him, however, that he must establish his industry in Canada almost simultaneously with that of his own country. If, however, he should attempt to do this he would in the majority of cases merely court financial ruin. On the other hand we offer him conditions which take away part of his right and force him into a compulsory license system which means that after his business is established, he may be obliged to surrender same to competitors that may spring up. The result to-day is that those inventors who are the wealthiest and have the most experience in protecting and exploiting their inventions have about concluded that Canadian Patents are not worth while.

It might seem that the exploitation in a neighboring country like the U.S. of a patent which is not protected in Canada, would result in indirect benefit to our manufacturers, who would be entitled to use the ideas without cost to themselves. This, however, is an illusion which seldom develops into reality. The result is that a domestic industry based on this patentable idea will not be established until many years subsequent to the invention and then it is no longer novel, for without the assistance and knowledge of the inventor, very little progress can be made in perfecting his idea.

A point of view which is not fully grasped by the public is that any invention to succeed must supply a want and enrich the public at the same time as the inventor. In the majority of cases the benefits to the public are in direct proportion to the benefits derived by those who originate and exploit the idea.

There are instances and conditions existing today of the following kind:

A foreign inventor who has proven that he has a valuable idea in the form of machinery or otherwise, is approached by the Canadian Manufacturer who can at once see the possibilities of selling this improvement in Canada. He learns, however, that no Canadian patent has been taken or if one has it has been allowed to lapse on account of non-exploitation within the limited period allowed. The inventor, thus having no right in the matter is not inclined to give up his experience or

information because he can still export his product to Canada. If he were willing to do so, the Canadian would have no advantage in establishing the product on the market, while any competitor is in a position to supply the demand after he has created it. His position is practically the same, if the inventor has a Canadian patent under the compulsory license clause.

There is no inducement therefore under such conditions to establish any improvement and old methods are allowed to remain until pressure is brought to bear from advances in the art by foreign manufacturers.

Conditions such as these apply also to process work, in which the writer is particularly interested and we often find that we cannot consider the exploitation of many things which would be of advantage to the country because of the insufficient protection surrounding the Canadian patent.

Moreover, we find that the idea is but very little use to us if it has been patented and allowed to lapse, although it would appear that we could take some advantage of this loss to the inventor. It is strangely true, however, that the inventors' loss is everyone's loss, because it takes time and money to establish an idea, just as it does to establish a business, and no individual can afford to establish an idea which does not represent to him some form of property, any more than a manufacturer can establish a business whose trade and goodwill will not represent any asset to him after he has created it.

It should be of special interest to the paper trade that the contract between the Canadian Government and the inventor should be such as would protect him to the fullest extent during the limited time given him so that no improvement of value will be lost to us in our trade developments. Even if an invention does not reach us for five years after it is taken out in Europe, and the Canadian Patent is five years old, if that patent is still a valid one, the idea could be taken up and established, and we would only be five years behind. If the patent, however, had been invalidated because the inventor has not been able to comply with some arbitrary limitations, the chances are that it will not be introduced into the country for at least fifteen years.

The assumption on the part of the Government in the way our patent laws at present are framed, seems to be that inventions and improvements can exploit themselves or will be exploited without protection.

This fallacy is shown by the attitude of any investor whom you may ask to join you in furthering something which would be an advantage to the public. His first question will be: is there proper patent protection and how much?

When we realize to what an enormous extent our industrial progress depends upon patented improvements, would it not be well to carefully consider, at our country, in its own interest can afford to discourage foreign inventors or confiscate their intellectual property.

PROTECTION FROM FROST.

During severe cold the paper machine room must be heated somewhat even on Sundays, because otherwise the formation of much condensed moisture in the form of drops is unavoidable when starting work again on Mondays. Also, rubber parts on the paper-machine such as deckle-straps, rubber driving-belts, etc., suffer owing to severe frost. Rubber deckle-straps for example when very cold may simply break when starting the wet part. Provision should therefore be made that the machine room remains sufficiently warm during severe cold.

MINIMUM CAR LOADING TO WEST.

(Special to Pulp & Paper Magazine.)

Ottawa, March 12. As the result of a Railway Commission hearing here last week, shippers and railways in Canada have effected a compromise as regards minimum weights for carload loading of paper and wood-pulp consigned to the Northwest. There has been considerable discussion over this matter ever since the Canadian railways announced their intention of advancing the carload minimum—the amount of shipment for which a carload rating may be obtained—from the former figure of 24,000 pounds to 40,000 pounds. This was considered a somewhat startling advance, and accordingly the Canadian Manufacturers' Association filed a complaint with the Railway Commission. The matter came up for hearing last week, and after very little discussion, it was agreed that the minimum should be compromised at 35,000 pounds, and an order was issued by the Commission approving this.

PARCELS POST.

The Post Office Department last week raised the maximum weight for parcels to be accepted in the parcels post to eleven pounds. It had been proposed to limit it to five pounds for three months, but as nothing like the rush of parcels that was expected has developed, it was decided to reach the maximum at once. The paper trade has already benefited more or less by the use of cardboard containers for various commodities, which are being sent through the parcels post in quantities, one egg container which was recently sent to the Postmaster-General, being long and cylindrical and accommodating the eggs placed end to end lengthwise. So far, Canadian manufacturers have failed to take advantage of their opportunities in this regard, and most of the sample containers submitted to the Post Office Department have been made by United States paper box manufacturers. As the Government is desirous of securing every possible benefit to the Canadian trade, however, from the parcels post, it is hoped that Canadian firms will take up this matter.

DOMINION WATER POWERS.

The Parliamentary Committee on Forests and Water-Powers held its first meeting here a week ago, and cleared the decks for the work it will do during the year. It was decided to call James White, Deputy Minister of Conservation, Hon. Adam Beck of the Ontario Hydro-Electric Commission; R. H. Campbell, of the Forestry Branch and Sir Richard McBride, premier of British Columbia. These experts will give evidence as to water power questions and the preservation of forest wealth, including the elimination of waste in manufacture into timber, pulp and paper. Mr. William Wright, M.P., for Muskoka, Ont., urged that legislation be framed for the transfer of timber lands to municipalities under certain conditions. He pointed out that settlers frequently obtained lands in Ontario for supposed agricultural purposes, cut and sold the timber or pulpwood with which they were covered, and then left them despoiled. Mr. Wright urged that it would be better to give these municipalities who could take over the task of reforestation and in fifty years would be assured of a new crop.

The Victoria Paper and Twine Co., Toronto, have removed into their new warehouse located at 439-441 Wellington Street West, Toronto.

FORESTRY AND PULP INDUSTRY

Address by Raphael Zon, of the U.S. Forest Service Delivered before the American Paper and Pulp Association, in New York City, on February 19.

The present economic era is witnessing a more rapid change in the uses to which raw materials are put than any other era in history. Especially is this so with respect to wood. In many industries, such as construction and building trades, wood, which not long ago was practically the only material used, is now being crowded out by concrete, steel, clay, iron, and fibrous products. Thus in steam railroad car construction only a few years ago from 3,000 to 26,000 board feet of lumber was used per car; now the wooden car is being replaced by the steel type, and practically no lumber at all is being employed. Likewise in the construction of warehouses, depots, platforms, bridges, trestles, and piers, the railroads are beginning to use more and more cement, brick, gravel, and cinders. For bridge and culvert construction, wood seems to have been abandoned on most of the principal lines. Similarly, there is a growing decrease in the demand for wood in the building trades. This is due to substitutes, especially for flooring, fence posts, shingles, and fences. The decrease in these uses within the past few years has been recorded to range from six to 16 per cent as compared with the same use several years ago.

Whatever the future use of wood may be in the construction and building trades, the use of wood in the pulp and paper industry has been constantly on the increase, and as far as our present knowledge goes, there is no other substitute that will take the place of wood in pulp and paper making. While there are many plants, the fibres of which are as well or better adapted to the manufacture of paper, there is no other plant which is capable of producing cellulose so cheaply and so completely as the tree. No other plant can be grown on such a large scale, nor in such adverse climates nor on such poor, rock soils as our northeastern spruce, hemlock, and balsam which are the chief sources of the pulp and paper industry. Practically all of the substitutes for wood, which have so far been suggested are bulky, producing a short fibre and a small yield. These may possibly become important in paper making when the suitable woods are no longer obtainable. Meanwhile the use of wood in the pulp industry is increasing rapidly at the expense of all other materials. Within the last decade alone, from 1899 to 1909, the use of wood in the manufacture of pulp has increased from two to four million cords annually, an increase of 100 per cent; this use is bound to increase in the future, though probably not at the same rate as in the past. It has been estimated by the Forest Service that by 1950 the amount of wood probably needed each year for the pulp and paper industry will be in the neighborhood of 16,000,000 cords, or approximately four times the present requirement.

This increase has been roughly estimated by decades as follows:

By 1920, 7,000,000 cords, an increase of 75 per cent over the present use.

By 1940, 10,000,000 cords, an increase of 50 per cent over the present use.

By 1960, 14,000,000 cords, an increase of 25 per cent.

By 1980, 16,000,000 cords, an increase of 25 per cent.

Of course all such estimates must be taken with some grain of salt, but it is reasonable to feel that the ap-

proximate demand may be; but, judging from the variety of uses now made of pulp and paper, and the rapid increase in output which has taken place during the last ten years, these estimates are probably sufficiently conservative.

I mention these figures also chiefly to impress upon you the connection that exists between the pulp and paper industry on the one hand and timber production on the other. The future of the pulp industry is closely bound up with the future of the timber supply in this country, especially that of the Northeastern and Lake States. There is still another tie that binds the pulp and paper industry to the production of timber. At the present economic condition prevailing in the country, there is an essential difference between the utilization of the forest for pulp and paper manufacture and its use for lumber. This difference consists in the greater interest of the farmer in the development of the nearby timber resources. Our lumber industry, especially in the past, and often now, is nomadic in its habits. Sawmills on the whole, especially in the Northeast, do not represent such a large investment of money as a pulp and paper plant. The depreciation is distributed over the comparatively short period of years during the logging of some particular tract. After the timber reachable from the one mill site has been cut the mills have often been entirely abandoned; the machinery is then either sold for scrap iron or part of it moved to some other place. There is not, under the present economic conditions, sufficient permanency of interest in developing the timber lands lying near the sawmill, but the sawmill moves to the timber wherever it is found. It is different with the pulp and paper plants. According to the last census, each pulp and paper mill represents an average investment of over half a million dollars. It is located, as a rule, at some advantageous point with an abundant supply of water and is intended to be permanent. It can be made permanent only by having the local forests properly handled. These economic considerations make the pulp and paper manufacturers interested in forestry at a time when forestry as a profession was still in its swaddling clothes.

One of your former presidents, Mr. Hugh Chisholm, was the first to provide for the organization of a forestry department in the International Paper Company. It was, perhaps unfortunate that at the time the pulp and paper manufacturers began to seek advice on forestry matters, the profession of forestry was still so young. Even superficial as this advice might have been, it resulted in bringing about a change in the viewpoint of many holders of timberlands in Maine, New Hampshire, and throughout New England. It is now generally recognized that forest maps and topographic maps showing the location of the timber are a necessary condition for the intelligent handling of the timber tracts of the Northeastern States. The same early recognition of the need of proper methods of handling the timber lands as a permanent source for pulp production led many of the pulp manufacturers to a closer utilization of the timber products. I really do not know of any other wood-using industry that practices such close utilization as the pulp and paper industry. Topwood, including branches, is now being

used by some pulp and paper manufacturers, especially in Pennsylvania, in sizes as small as two inches outside bark at the middle of the stick, and the only other competitors for the same kind of material are the acid factories. The use for pulp of waste material left after lumbering has recently been introduced in parts of Pennsylvania. Hemlock tops and broken, defective logs are peeled, cut into 5-foot lengths, piled in the woods, and sold by the cord. From 250,000 to 260,000 cords of slab wood, and other so-called mill wastes, are now consumed every year for pulp. In 1908, hemlock formed 41 per cent of the sawmill waste used, and its average value was \$4.07 per cord, about two-thirds that of hemlock cordwood in the round. In Wisconsin, sawmills often sell their hemlock slabs to paper mills for from two to three dollars per cord.

Because of the need just discussed of permanent local forests, the pulp manufacturers were the first who made use of trained foresters. They employed with good effect men of high standing in the profession, such as Austin Cary. For the same reason, the pulp companies were the first to be interested in the future supply of timber, and turned their attention to planting the cut-over areas. The Remington-Martin Company, I believe was in the lead of this reforestation policy, having planted in 1905 about 600,000 Norway spruce trees. In 1910 the International Paper Company began its reforestation work with the planting of 650,000 Norway spruce, while a number of other companies have also started large plantations.

These facts again go to show that economic interests of the pulp industry are tied up with the permanent development of the timber supply. Is, however, the supply itself sufficient to meet the enormous demand for pulpwood in the future, and what are likely to be the changes in this gradual adjustment of the demand to the supply?

It has been estimated that the total stand of woods chiefly used for pulp is 130,000,000,000 board feet, of this 50,000,000,000 board feet is spruce, 75,000,000,000 board feet hemlock, and 5,000,000,000 board feet balsam fir. These three species are now being cut for both pulpwood and lumber at a rate that should exhaust the entire stand in about 25 years, not counting the growth of new timber on one hand nor the increasing demand for it on the other.

This discouraging outlook, however, is not so black as it seems. First, some new growth is added on every year. Our wild woods, poorly as they are stocked, burned, and over-cut, are still producing some new wood. Even assuming that the increment on the 130,000,000,000 feet of standing timber is only 1½ per cent, that would mean an annual increment of about 2,000,000,000 feet, or 1,000,000 cords, provided the forest area occupied by this timber is not being actually devastated. Considering, therefore, the entire spruce-bearing land of the Northeast, and the Lake States, there is just enough timber produced every year to maintain the present demand for pulpwood. The pulp industry, however, is not the only one that lays claim on this increment. As a matter of fact, the lumberman still uses nearly three-fourths of the entire cut of spruce, hemlock, and balsam for lumber. Small as this increment is, still, it contributes to the prolongation of the present stand.

The adjustment between the increasing demand for pulpwood and the decreasing supply of such woods as spruce and poplar which, until recently, were the staple woods used, takes place in the use of new kinds of wood.

The total pulpwood consumption in 1909 was slightly more than in 1907, yet all of the leading woods which composed it showed decreases. The increase was in new woods which were but little used before.

Balsam, which in 1907 had an output of 44,000 cords, in 1909 sprang up to 95,000 cords. Pine with 79,000 cords in 1907 went up to 91,000 in 1909. White fir, which was not even listed in 1907, furnished 57,000 cords in 1909. These woods have not yet assumed very large proportions in production, but their entrance and rapid increase is significant. It shows that they can be used for this purpose. That is one important point. Another point equally important is that they are fairly well distributed for the convenience of the pulp industry and that their supply is large. Balsam may be said to be co-extensive with spruce, and, though less abundant, it will considerably extend the supply in the region where it occurs, for it may be logged and manufactured along with spruce. The pine which is used is undoubtedly of two or three species, including scrub pine of the East, loblolly pine of Virginia, and North Carolina, and jack pine of the Lake States. The supply of pine available for this purpose is large. It occurs in dense stands distributed locally through a very extensive region. Loblolly pine attains size for lumber in forty or fifty years and is widely cut for the purpose. Scrub pine and jack pine are not esteemed for lumber on account of their small size. This makes them all the more available for pulp. White fir is found only in the West. Its contribution to the pulp supply thus far has been limited to the Pacific Coast. The stand of this fir is large in the Northern Rocky Mountains, the Cascades, and the Sierras, and scarcely any of it has been cut. On account of the abundance of other more valuable woods in the West for lumber, there will be little demand on white fir for that purpose. The supply will all be available for pulp.

The bringing of these woods into the field materially adds to the pulp supply. And their introduction leads to this inquiry: Are there not other woods just as available for pulp, the introduction of which would still further extend the available supply? Without any question there are a number of such woods. If we can use jack pine, we can also use lodgepole pine, the fibre of which is known to be good, and the stand of which is enormous. We can also use Engelmann spruce and alpine fir, which occupy nearly the same range as lodgepole pine and white fir in the Rockies and the Cascades and Sierra Mountains. If, as experience shows, we can use white fir, it is reasonable to believe that we may use other firs of the Western States—lowland fir, *amabilis* fir, and noble fir, which occur in rather great abundance. Other woods might be mentioned, but enough have been cited to show the possibilities in this direction.

How are these hitherto unknown woods to be tested, and how are manufacturers to learn of the qualities? In this connection, we should consider the tests under way at the Forest Products Laboratory at Madison, Wis. The Laboratory is equipped to make tests by the sulphite and soda processes and the work is now going on. The programme includes tests on a semi-commercial scale, in the pulping and paper-making qualities of the woods above mentioned and others, such as long-leaf pine, paper and yellow birch, western hemlock, and Douglas fir. Besides ascertaining the fibre qualities and yield, it is expected to determine the best cooking conditions and the methods of hand-

ing the product for each wood. In this way, it is planned to test out four or five woods per year.

The issue of February 14 of the New York Herald is printed in part on paper made from several western firs, which have not been used heretofore for news print paper.

Of especial interest perhaps is balsam fir, which is finding increasingly greater employment as pulpwood. Balsam fir in 1910 constituted about 6 per cent, or 132,362 cords of the total 2,220,000 domestic coniferous woods used in the United States by the pulp industry. The principal objection to the using of large amounts of balsam fir in the ground pulp process is on account of the pitch, which covers the felts and cylinder faces, and thus ruins them. It is admitted by nearly all pulp and paper manufacturers that from 10 to 20 per cent of balsam can be used in ground pulp without lowering the grade of the paper produced. Some go even so far as to claim that the moderate addition of balsam fir, from 20 to 25 per cent, is of advantage in that it makes the pulp free, that is, separates the spruce fibers during the manufacturing process and in this way allows the water to be easily drawn from the sheet. In chemical pulp, because of the acids dissolving the pitch, any amount of balsam can be used, although some claim that paper made from pulp containing a large proportion of balsam lacks strength, snap, and character. The pitch gives most trouble in freshly cut balsam, while in wood soaked in water over one season, the amount is so small that it need not be taken into account. Some of the larger mills claim that after balsam fir has remained in a pond for one year any amount of it can be used.

The complaints against the larger amount of pitch in balsam fir are somewhat strange in view of the fact that the actual resin content of balsam fir is less than that of spruce. Resin in coniferous wood occurs normally in cells, of which the wood is built up as a house is built of bricks, and in the spaces between the cells, known as resin ducts, running vertically and horizontally through the wood. These resin ducts may be seen on cross sections of freshly cut wood as whiter or darker spots marked by exuded droplets of resin. On radial and tangential sections the ducts appear as fine lines or dots of different color. The difference in resin content of the different genera and species of the conifers depends mainly upon the number and size of their resin ducts. Balsam fir is one of the few conifers that lack resin ducts entirely, a thing which serves readily to distinguish it from the spruces and pines. Resin is found in the wood of balsam fir only in the interior of the cells, where it occurs in the form of small droplets. The bark of balsam fir is very rich in resin, but after the forer is roused off the wood should be free of resin, than spruce, which contains resin ducts and resin cells. Therefore the pitch, which according to all reports is the greatest drawback to balsam pulpwood, must either come from the resin in bark left on the surface of the block or else is formed in the process of aging, in which case it is not of a resinous nature. In either event, the presence of pitch is apparently not due to any property of the wood itself.

There is no doubt that the fiber of balsam fir is weaker, shorter and softer than spruce fiber, therefore the prevailing practice of soaking balsam fir with spruce in both mechanical and chemical processes ordinarily results in an inferior grade of paper. If the admixture of balsam is considerable, there is not so perceptible a weakness in the presence of the ground pulp. The wood should be more softer, and more easily than

spruce wood; therefore, a stone of a sharpness and at a given pressure to produce good strong pulp from spruce makes poor pulp from balsam fir. With dull stones and light pressure a better quality of pulp could probably be made from balsam. Similarly in the case of chemical pulp, better results could most likely be obtained if weaker acids more suitable to the softer nature of balsam-fir fibers were used. The different properties of wood of spruce and that of balsam fir naturally suggest a different treatment of their fibres, which could best be accomplished by handling them separately. Experiments in this direction would probably open a much larger field for the use of balsam pulpwood than it now has.

Small Yield of Wood Fiber.

Another drawback to balsam as compared with spruce is its smaller yield in pulp and paper per cord of wood. Being lighter than spruce when seasoned it contains less wood substance per cord and so yields a smaller amount of pulp. The following figures regarding the yield of chemical and mechanical pulp per cord of spruce and balsam are based on actual experience and may be considered as average:—

	Ground pulp Pounds per cord.	Chemical pulp (sulphite) Pounds per cord.
Spruce	1,800	1,200
Balsam Fir	1,500	1,000

This drawback, however, would not exist if the stumpage price of balsam pulpwood were proportionately lower than, instead of being nearly the same as, that of spruce. Some mill men even claim that the only objection they have against balsam fir is its smaller yield in pulp, which, at the same stumpage price as spruce, makes its use unprofitable and discourages any attempts to improve methods of utilizing or manufacturing it.

In comparison with spruce, balsam is a short-lived tree, and is apt to become defective by the time it reaches large size. A log from a large tree which may seem apparently sound will, when cut up into blocks, often show heart rot in some portion of its length, or, still more frequently, the fibers at the center will be of soft texture, making its use uneconomical. Decayed heart is not so common in young, small-size trees, and since small logs contain more sap and produce better fiber than large ones, balsam of small diameters is not only suitable for pulpwood, but is to be preferred to the large sticks.

Knots, though more numerous in small sticks than large ones, are not a serious objection. They can be cheaply removed by passing the chipped wood through a tank of water, in which the knots sink and the wood is carried off from the surface.

Balsam fir cut in winter produces firmer and harder paper than wood cut in summer.

The general tenor of nearly all pulp and paper manufacturers was that balsam fir is undoubtedly inferior to spruce in every respect, but that it has come into the pulp industry to stay. It fills a place in the economy of paper making, and its drawbacks are of such a nature that they may be to a great extent, if not entirely, overcome by intelligent effort.

In addition to the conifers, there are still untouched supplies of hardwood, which grow within the same region as the spruce, such as, maple, beech and birch, which are already finding use in the manufacture of chemical pulp and paper.

To be Continued.

PULP AND PAPER NEWS

The Central Pulp and Paper Co., has been incorporated in Winnipeg with a capital of \$200,000.

Among the new companies which have recently been granted incorporation is the John C. Gilchrist Lumber Co., of Toronto, with a share capital of \$200,000.

Joseph Kilgour, of Kilgour Bros., Toronto, who is the President of the Canada Paper Co., and wife, have returned from spending several weeks in Florida and other southern States.

The latest aid for gardeners consists of seeds pasted into a strip of paper tape. All the gardener has to do is to make a drill, lay the tape down, and cover it up. Nature does the rest.

The Interlake Tissue Mills, Limited, which are now turning out large quantities of crepe towels and toilet paper as well as other lines at Merriton, will shortly place on the market a fine range of decorative crepe papers.

The St. Lawrence Paper Mills Co., Limited, Toronto, have moved into their fine large new offices on the third floor at the front of the Bell Telephone Building where the different officers have splendidly fitted up quarters.

Robert Davis, president of the Don Valley Paper Co., Toronto, who has been confined to his home for several months is making fair progress towards recovery and it is expected that he will be able to be around as soon as the warm spring days arrive.

A charter has been granted to the John C. Gilchrist Lumber Co., Limited, of Toronto. The share capital is \$200,000 and the incorporators are John C. Gilchrist, George H. Gilchrist, and Sinclair M. Gilchrist of Toronto, C. Patterson and Arthur S. Winchester, all of Toronto.

The Book Publishing Co., Limited, of Winnipeg, have been granted a charter with a capital of \$200,000 to carry on a general printing, engraving and publishing business. The incorporators are Edward Campbell, William J. Eagleson, James McCubbing and John W. Mitchell.

The Roberts Advertising Company, Limited, of Toronto, have been granted a charter with a share capital of \$500,000 divided into five thousand shares of one hundred dollars each of which two thousand shares is seven per centum preference shares. The company are given wide powers, and authorized to carry on a general advertising and publicity business in all its branches.

The George Powley Paper Co., Limited, which has been doing business in Toronto for a number of years made an assignment a few days ago to F. C. Clarkson, who is receiving tenders for the assets. The assets, which consist of paper, twine, matches, plant, warehouse and office furniture, amount to \$5,788.36, and it is understood that the liabilities are considerably in excess of this sum.

The Fort William Printers, Limited, with head offices in Fort William, Ont., have been granted a charter. The incorporators are: John A. Head, John A. Dyke, Robert H. Neeland, David E. McKay and Peter Ross,

all of Fort William. The company are empowered to print and publish newspapers and periodicals of all kinds, and to manufacture and deal in paper, envelopes, boxes and general stationery.

The Don Valley Paper Co., Toronto, have recently installed a 250 h.p. motor, and now all the equipment in the beater room is run by electric power. The company, which some time ago started the manufacture of antique covers in various colors, weighing from fifty to sixty pounds, report business as good in this line. They have just issued to the trade a neat booklet showing not only the new cover papers, but some fine specimens of colored Bristols, sulphite tag, mailla tag, colored poster and envelope manilla.

Owing to the breaking up of the ice in the St. Lawrence river and damming back the water at the first level of the Cornwall canal, the St. Lawrence Power Co. of Mills Roches, from whom the St. Lawrence Paper Mills obtain their power, have been somewhat handicapped for the past few days, and have had to shut down at certain times one of their machines as well as the calenders and other parts of the equipment. The trouble has now disappeared, and the plant of the paper company is again running.

Since the new tariff was brought into effect last autumn by the United States Government the exports from British Columbia have been doubled. The greatest gains have been in the shipment of shingles, lumber of different classes, ground wood pulp, etc. It is the general opinion among those in touch with the lumber situation that the placing of shingles on the free list has imparted a big stimulus to the industry in the Pacific Coast Province.

A. M. Huestis, of Toronto, who represents several Old Country and American mills has been appointed selling representative in Toronto and Ontario for the Georgetown Coated Paper Mills, Limited, of Georgetown. L. E. Fleck, vice-president and manager of the company, who has looked after the sales, will devote more attention to the executive and manufacturing end. The plant is busy and a very satisfactory year is reported.

The fire ranging system of Ontario will be extended and improved. Hon. W. H. Hearst, Minister of Lands, Forests and Mines, has taken over the provincial parks from the Department of Public Works and a complete reorganization of the branch is under way. There will be telephone connection between the principal stations and more men employed and additional fire equipment acquired. In this way the chief ranger will be able to summon help from outside districts or to so place his men as to stop a fire from spreading. For this work the sum of \$25,000 is asked.

At the Hydro-Electric Radial Field Day Convention, which was held recently at London, Ont., a resolution was passed calling upon the Dominion Government to assist the Hydro Railways scheme to the extent of \$6,499 per mile bonuses and asking that the plans for the furtherance of the deep waterways projects be favorably acted upon, and it is likely that a large deputation will go to Ottawa. The deputation will be merged with that of the Waterways Association, which will ask for

the immediate deepening of the Welland canal, of the Saint Lawrence and the St. Lawrence canals and in the same connection for the preservation to public ownership of the water rights on these waters. Hon. Adam Beck, Minister of Power, pointed out that there is now about 400,000 h.p. of water available at Niagara for the development of power, and announced that tenders have been received from a number of development companies asking for these rights. One of them—the most liberal—claims to be able to develop by an advanced method upwards of 1,000,000 horse-power. The right is asked to export only forty per cent of this, whereas existing companies are exporting fifty

per cent. This company, however, asks the Ontario Government to pay \$12 per horse-power as against \$9 paid to the Ontario Power Company. Instead of accepting this offer, Mr. Beck advocated the development by the municipalities themselves of the energy available by the construction of the new Welland canal, where he claimed it was possible to secure 224,000 horse-power at cost and twenty miles nearer the market. If radial railways were to amount to anything, they would, he said, create a market for this power, first for the operation of the roads and secondly by carrying power to districts that would not otherwise be available to secure it.

DRYDEN TIMBER AND POWER CO., LIMITED

(Special to Pulp and Paper Magazine)

The construction of the new Sulphate of Soda Pulp and Paper Plant of the Dryden Timber & Power Co., at Dryden, Ont., was completed in May of last year, and proved satisfactory in every way, with exception that

the evaporator capacity in the Soda Recovery Room was found to be inadequate. During the last two months the vacuum evaporator has been enlarged to double its original capacity, and it is now capable of handling black liquor from the manufacture of a minimum of forty-five tons of Sulphate Kraft Pulp per day.

This reconstruction work has been completed; the mill is in operation again, and everything is working very satisfactorily. Forty tons of extra-strong pure Kraft pulp and Kraft sheathing paper are now being produced daily.

Dryden strong kraft pulp is very favorably commented on by manufacturers of high-test box board kraft paper. Those manufacturers of kraft paper, who are using Dryden pulp, have found that they can produce a kraft paper, testing over a point per pound, with less time in the beaters than is necessary to produce the same sheet from other makes of pulp. This is owing to the fact that the Dryden mill has a complete installation of beaters equipped with Basalt Lava stone rolls and plates, and all the pulp is well beaten; thus effecting an economy in time and power required when it reaches the paper mill.

Mr. J. B. Beveridge, the General Manager, reports the business outlook as being very good, contracts covering a large proportion of their kraft sheathing paper and kraft pulp production for this year having already been made.



J. B. BEVERIDGE,
Dryden Timber and Power Company.



Plant of Dryden Timber and Power Co., Dryden, Ont.

UNITED STATES NOTES

(Special to Pulp & Paper Magazine)

The paper waste and rag warehouse of Fisher & Kurnitsky at 68 Liberty Street, Springfield, Mass., was destroyed by fire last week together with all its contents. The fire department responded to an alarm at 11.39 o'clock, but as the fire had already gained considerable headway, the firemen could do little except prevent the spread of the flames.

Edward L. Rantoul, formerly of Salem, Mass., is among those prominent in the development of a million dollar pulp company. A Massachusetts charter was issued last week at the State House to the Androscoggin Pulp Company, capitalized for \$1,000,000. Associated with Mr. Rantoul in the corporation are James M. Wheaton and Richard S. Russell.

E. M. Hancock of Milan, N.H., has taken the contract for a large quantity of pulp wood to be taken from timber lands near the Dead Diamond Wood on camps and storehouses, has already commenced.

The Standard Paper Company, with principal place of business at Bellows Falls, Vt., has been incorporated with a capital stock of \$9,000. It is authorized to manufacture and sell gummed and adhesive paper. The promoters are: Albert L. Brookhouse, Rowe C. Wales, George R. Wales, Alice T. Brookhouse, G. H. Thompson of Bellows Falls.

Fire that started from unknown causes in the stock room of the George C. Gill Paper mill division of the American Writing Paper Company at Holyoke, Mass., several days ago, gave the members of the fire department a hard battle for more than an hour. The blaze was in a pile of paper shaving bales and between 15 and 20 of the bales were damaged. Several lines of hose were laid into the mill and after much effort the firemen succeeded in confining the fire to the bales.

Several of the larger paper manufacturers of the United States have stated to the Interstate Commerce Commission of Washington that they have no protest to make against a raise in freight rates, but are willing to abide by the judgment of the commissioners. In view of the fact that what the commission says goes, the attitude of the paper men seems to be decidedly diplomatic.

For the year ended December 31, the United States Envelope Company, of Springfield, Mass., reports a balance available for dividends of \$581,658, a decrease of \$50,481 from the earnings of the previous year.

The Columbian Paper Company of Jackson, Miss., began the manufacture of pulp from pine wood last week. This is the first time the plant has even undertaken to manufacture pulp from pine wood, although a little pine has at times in the past been mixed with other woods used in manufacturing the pulp. There is a considerable amount of pine on the yards of the plant at Jackson, which will be used in experimenting with the manufacture of pulp from that wood.

Circular saws are made of paper for use in manufacturing veneer and fine furniture. Thin plates of wood cut by these saws are so finely finished that cabinet makers do not have to plane them at all before they are used. The saws, driven by an electric motor, are made from compressed drawing paper. Indeed, compressed paper of such hardness has been made that it has even been used in place of building stone.

William R. McHaffle, who for a number of years has been general manager of the Lebanon Paper Mills at Lebanon, Ore., has been transferred to San Francisco, and will have charge of the company's office at that place. Mr. McHaffle will move his family to San Francisco at once. He will be succeeded in the mill by W. E. Graves, who has been mill accountant for six years. C. H. Ralston of this city will fill the vacancy made by reason of Mr. Graves promotion. C. J. Buchanan, of Oregon City has been appointed superintendent, with F. A. Waddock of Lebanon, as his assistant.

Fire on March 1 destroyed the Bedford Paper and Pulp Company's mill at Big Island, Va., with a loss of \$500,000 covered by insurance. The company will rebuild immediately.

The stockholders of the Whitaker Paper Company, of Cincinnati, Ohio, have approved the proposal of the Board of Direction that the capital of the company be increased from \$500,000 to \$1,000,000. Of the increase \$25,000 will be preferred, and the remainder common.

Architect L. A. DeGuere of Grand Rapids, Mich., is preparing plans for the rebuilding of the Borkaw paper mill, recently destroyed by fire. The new building will be of concrete, steel and brick.

Peter G. Thomson, president of the Champion Coated Paper Company of Hamilton, Ohio, was placed on trial at Washington on March 5 on an indictment charging attempted bribery of a post office inspector. The Government charges that when the inspector found paper made by Thomson's company for postal cards below quality and refused to accept it, Thomson sent him \$100 through the mails.

C. J. Buchanan, night superintendent of the Williamette Pulp & Paper Company at Oregon City, Ore., who has been connected with that company for 22 years, has been appointed superintendent of the Lebanon Paper Company at Lebanon, Linn County, to take effect at once. His family will accompany him to that city.

Lewis J. Powers, 13 years old, of Springfield, Mass., has invented an electrical paper counting machine which is to be given a try out in the big paper plant at Springfield, owned by his grandfather, L. J. Powers. The youthful inventor worked out the main principles of the machine while in a hospital convalescing from an operation for appendicitis. If the counter in actual use proves as efficient as preliminary tests indicate the inventor will receive a handsome royalty from his grandfather. He has already applied for a patent.

According to a report just received the lumber cut on the Kennebec River in Me., and its tributaries will exceed that of last year. The total cut as estimated is 207,750,000 feet, whereas last year the total cut as reported was about 138,000,000. The total on Moose River is about 58,650,000 feet, and of this 22,000,000 is held up to be sawed at the landing; Moosehead Lake region, 44,000,000 to be taken by rail, Dead River, 30,385,000, East Branch and Main Kennebec, 40,945,000; 11,500,000 feet is to stop at North Anson, to be used by the Newville Lumber Co., and some at Bingham. The lumber concerns cutting the largest amount include Hollingsworth & Whitney, about 50,000,000 feet; Great Northern Paper Co. about 21,000,000 Lawrence Bros., about 12,000,000; Newcastle Lumber Co., 11,500,000 for North Anson, 3,500,000 for Jackman; Skinner-French, 8,000,000 for Skinner-Bingham Lumber Co., 6,000,000; W. T. Haines, 7,000,000 at Dead Water; Hume & Newhall, about 8,000,000. Lumbermen report that the condition for operating has been good so far this season, with the exception of too little rain.

The officials of the American Writing Paper Company of Holyoke, Mass., held a banquet one evening last week at the Nayasset Club in Springfield. Including a number of invited guests, there were 53 in attendance. General Manager Alfred Leeds presided. Fred. H. Sturtevant was chairman of the committee of arrangements. The affair was informal with few stated addresses; and despite the excellence of the menu, the assemblage broke up at an early hour.

RIORDON EARNINGS.

Riordon Pulp & Paper Co. profits for 1913 were \$228,073 as compared with \$226,250, a year ago. Figures showing the amounts paid as interest and depreciation allowance are as follows:

	1913.	1912.
Profits.	\$309,679	\$306,834
Depreciation	48,953	30,399
	\$260,726	\$276,435
Interest	32,653	50,185
Net profits	\$228,073	\$226,250

Sales for 1913 fell short of 1912 by \$98,946. In spite of which, profits were slightly larger. The statement may be considered very satisfactory considering general conditions.

Sulphite Pulp Mill capacity is now forty per cent greater and the company has increasing lumber output by operating at nights. Eighty-four per cent of the company's products for the year is already sold at satisfactory prices. During the year the company expended \$100,000 on property making fixed assets \$6,462,841, current assets \$1,860,317, current liabilities \$2,500,000, against \$3,443,088 and \$361,882 respectively a year ago.

At the annual meeting of the Toronto Reform Association held last week, Major A. A. Mulholland was elected president. Major Mulholland who is now residing in Toronto, retired from business three years ago. He was former president of Northumberland Paper and Lumber Company of Campbellville, Ont.

ONTARIO WORKMEN'S COMPENSATION ACT.

(Special to Pulp & Paper Magazine.)

Ottawa, March 13.

The Workmen's Compensation Act, which will come before the Ontario Legislature this session, has been endorsed by labor men throughout the province. They have asked the support of the members to prevent any changes in the maximum amount of indemnity in the Workmen's Compensation Act. The Canadian Manufacturers' Association are, on the other hand, not inactive, and Secretary G. M. Murray has addressed a letter to the M.P.P.'s on the subject in which he says, in part:—

"In legislating upon a subject surrounded with so many complexities and fraught with such far-reaching possibilities to the industries of the Province, we assume that you will welcome any information that you can obtain from those who have given the subject careful study. To this end we purpose sending you from time to time during the next few weeks while the matter is under discussion, memoranda on different phases of the subject. We ask you to assume that in doing so we will be actuated by a desire to assist in securing for the Province the very best act that it is possible to advise. We appreciate that there are features of such legislation which must necessarily be in some measure an issue between conflicting interests, but there are a great many features of a workmen's compensation bill, the greater part of the features, in fact, in which the interest of employers, workmen and the community in general is common.

We recognize that there is a tendency on the part of those who have not been in touch with the work which the association has done in connection with workmen's compensation to assume that 'the manufacturers are fighting the workmen's compensation bill.' Our draft bill which is on record in the Commissioner's report, is a standing and unanswerable refutation of any such charge. We have not opposed, and are not opposing a reasonable, in fact, liberal compensation measure. Our work throughout the whole of the Commissioner's investigation, covering intermittently a period of three years, has been of a constructive, and not a destructive character, and nothing in our action during the discussion of the measure in the House will depart from our past policy. The memoranda which are to follow, dissociated as they will be from anything in the way of a personal canvass, will, we hope, be a further evidence of our desire to prove of service."

CANADA PAPER MAY PAY BACK DIVIDENDS.

Earnings of the Canada Paper Company for the past year, while they were considered satisfactory were not quite as high as in 1912, according to the annual statement presented to the shareholders.

No reference was made to the question of dividends, but it is understood that the directors propose to carry through a plan which was formulated some time ago to make a settlement by which preferred dividends for three years, or 24 per cent in all, should be paid, shareholders relinquishing all claims of the balance. Ninety per cent of the shareholders have accepted this plan.

The company has outstanding \$200,000 first mortgage bonds, \$150,000 second mortgage bonds; \$344,100 preferred stock, and \$388,000 common stock.

The board of directors was re-elected as follows:—Jos. Kilgour, president; Sir H. Montagu Allan, vice-president; H. S. Holt, C. R. Rossner, F. W. Molson, Hon. Robert Mackay.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

(Special to Pulp & Paper Magazine)

London, March 2, 1914.

Owing to the high costs of coals, chemicals, pulps, freightage and the general increase in wages, paper mill owners in the United Kingdom are giving serious attention to their machinery and other plants with a view to bringing down the cost of production to the smallest minimum without in any way interfering with the quality of paper they are noted for. The result is that firms supplying machinery and other incidentals are having a brisk time, amongst them being Messrs. Walmesley & Co., Ltd.; Bertrams, Ltd.; James Bertram & Son; Spencer & Sons; The West End Engine Works Co., Ltd.; Milne & Son, Collis & Sons; T. J. Marshall & Co., Geo. Christie, Ltd.; Porritt Bro. & Austin, and Fox, Stockell & Co. These well-known firms report a brisk period of business with the mills, and in addition, greater attention is being given to electricity for power and lighting purposes. Walmesley's are engaged on several machines, whilst Messrs. Bertrams, Ltd., have just started up one of the very latest paper making machines at Bridge Hall Paper Mills, in Bury, Lancashire, and have four others on hand for firms who make high grade papers. The Wall Paper Manufacturers, Ltd., have had erected a machine which carries a wire of 106 inches and 50 feet long, and is complete with stuff chests, pumps, two patent full driven strainers, etc. At Bristol, the Imperial Tobacco Company of England and America has erected a new board mill for their own use. It is run by electricity and no expense has been spared. It is reckoned to be one of the most modern mills in existence. English firms supplied the machinery.

The trade union label question has not yet been seriously considered by the British paper makers. The unions want all the mills to employ trade unionists, pay trade union rate of wages, and display the trade union label. If they do not fall into line the unions are threatening all sorts of penalties. The position of the unions and the mill owners is like that of the Biblical story of little David and Goliath, the only difference being that the manufacturers will require a lot of "slaying." Altogether there are 50,000 workers engaged in the production of paper in the United Kingdom, and it may be pointed out the unions have not even 15,000 of these workers within their ranks. With this great deficiency, they contend that they are going to force the mill owners into the method of adopting the label to show that the paper from their mills is made by trade union workers, and to enforce their object all the trade federations and other labor bodies are to be called upon to use their best efforts to reject paper which is not produced according to the principles or which the label stands. A more fallacious idea was never in the history of British papermaking put forth, particularly as the unions are representative of a very small minority. It appears the assistance of the American paper makers brotherhood is to be requested in helping the unions on with the movement. Of course, all these objects sound nice, and read nice on paper, but when the British mill owner is properly approached on the label question, it is to be feared the

unions will receive the greatest shock they have ever experienced since coming into existence.

By the way, the Paper Mill Workers' Union in Lancashire is trying to patch up a little discontent, and the incident goes to point out that when they (the workers) cannot agree among themselves, what would things be like assuming that they had control of all the British mills as trade union mills? In the Bury district the other night the workers who belong to the union gathered together to consider the decision of their Executive Committee on the question of splitting the Bury, Radcliffe and Ramsbottom branch. The branch desired to remain as at present with a paid secretary, Mr. Ross, the general secretary of the union, explained in some straight talk to some of the recalcitrants that the Executive's decision must be adhered to, and that until such times as the branches were formed separately and put themselves in compliance with the rules as regarded the working of the branches, they could not have any delegates at the annual meeting of the union, and the sooner those two districts got together and elected their officials it would be better for them and the union. The Executive also send down word to Lancashire that as soon as possible definite steps should be taken to form a district conference for Lancashire and neighboring counties. Needless to say, there were some very strong protests and arguments against this dictation of the Executive of the Union to its paying members, but no resolution was put before the meeting. Mr. Ross and his union are now in the South of England trying to get paper mill owners to shut their mills down for a Saturday half holiday, but so far, no information has leaked out as to the progress made.

A report has reached England from Berlin stating that the German Wallpaper Convention has been renewed for a further period of twelve months. Of the 55 German Wallpaper manufacturers, 30 are now members of the Convention, and it has been decided to make an attempt to induce the others to join. It is also stated that business is not particularly good at present in the "Fatherland," so that one may now expect an influx of wallpaper travellers and agents in the United Kingdom, America and Canada, as an outlet must be got somewhere to keep the machinery going.

The Lord Mayor of London (Sir T. Vansittart Bowater, who is head of the firm of W. V. Bowater & Sons, is going in State to spend a week-end in his native city of Manchester. The Manchester Corporation have decided that the State apartments in their town hall should be occupied by Sir Vansittart, and, in addition, he is to have the freedom of the city conferred upon him as he is the first Manchester man who has occupied the Mayoral chair of London since the 17th century. Sir Vansittart has a great wish for Canadians, and their paper trade, and one of the first things he remembered when he was elected to his present position was to send his greetings to Canada by the medium of the Pulp & Paper Magazine.

The Waterside Paper Mill Co.'s mill at Darwen, or, to be precise, at Grimshaw, close to Darwen, has been partly destroyed by fire. The damage is estimated at \$48,000. During the early part of the morning on the 23rd February, two workmen were getting things ready for the mill workers, and they noticed a quantity of waste paper on fire. It spread rapidly, and one of the men ran to a telephone to ring up the local fire brigade. Unfortunately he was totally ignorant as to how to use the 'phone, and his efforts were unsuccessful. The other man spent his time trying to extinguish the flames, and in doing so got badly burnt. With this delay the fire spread furiously and no brigade was on the scene until someone in a neighbouring works observed the outbreak and by a stroke of good luck managed to call the local fire-fighters up by the telephone. They were soon on the scene, but they arrived too late. The splendid mill, which turned out cartridges, bagging papers, envelope papers, and other kinds on a 90-inch machine, now stands with only the bare walls and about 200 workers are idle. The mill was a neat, compact little structure and was doing splendidly. It cannot be too often pressed home to Canadian mill owners that for the protection of their property it is absolutely necessary to have a well equipped fire brigade on the spot—men who are drilled and trained with up-to-date appliances—and if this is insisted upon, they will find that money spent on fire fighters is money well invested. A good fire often makes a mill owner realise his position and want of common-sense.

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The directors of the Culter Mills Paper Company, Ltd., Scotland, have submitted their balance sheet to the shareholders for the year ended 31st December, 1913. The profit for the year is £8,829 18s. and this added to the balance of £3,345 carried from the previous year, makes a disposal balance of £12,175, which the directors recommend be disposed of as follows:—By paying a dividend of 5 per cent absorbing £3,500; by carrying to works and property, thus reducing their value to £78,000, £6,141; by leaving at credit of profit and loss account £2,533. In their last report the directors expressed their belief that the profits of the year now under review would be seriously affected by increases in the prices of coals, and of raw materials. These increases have continued throughout the whole of the year, and are still maintained. In addition to this, considerable loss and inconvenience have arisen from frequent interruptions to the manufacture through the installation of new plant, including the rearrangement of power. These interruptions, however, will not be at an end, and as bearing on the prosperity of the mill, the fact deserves to be noted that the new plant and the power rearrangement are working very satisfactorily. As previously announced in the Pulp and Paper Magazine, a fire occurred at the mill on January 10th, by which the rag-house, the esparto dusting house, and part of another house were wholly destroyed. The reinstatement of these buildings, which were insured, is now being proceeded with.

* * * *

Amongst the paper mills which have declared dividends during the past couple of weeks are:—Townsend & Co. Ltd., for the year 1913-4, 7 per cent, a profit of \$1,000,000 being made. Mather & Platt Ltd., for 1913, 10 per cent, a profit of \$1,645,244 being made. Annandale & Son, announced a bonus of \$18,000 to credit of profit and loss account. The Looe-on-Paper Mills Co.,

Ltd., are petitioning for the confirmation of the reduction of the capital of the company from £200,000 to £106,250.

WATERGLASS IN PAPER SIZING.

A. Froberg describes a method of paper sizing which consists in forming a gelatinous precipitate of silicate of alumina in the pulp by the inter-action of sulphate of alumina and waterglass. Sulphate of soda is, of course, also formed if soda-waterglass is used, as is practically always the case.

Magnesium sulphate, a cheaper salt than aluminium sulphate, has been proposed as a substitute for the latter, but the pulp is made too alkaline. At the same time it is quite possible to replace part of the aluminium sulphate by the magnesia salt. A mixture in which the various acids and bases are in the following weight proportions: SO_4 . 823; MgO . 337; Na_2O . 517; Al_2O_3 . 67; SiO_2 . 500.

More than 90 per cent. of the alumina, magnesia, and silica used are obtained in the size which is, however, alkaline. If the Al_2O_3 is doubled, the size is nearly neutral, but the proportion of the compounds obtained as size falls from 90 per cent to 55 per cent, the rest going into the backwater. The addition of starch saves part of this loss. Pulp sized with silicate can not be dyed with basic dyes, but the direct cotton colors can be used.—*Wochenblatt für Papierfabrikation*.

G. B. STEFFANSON GOES TO BATHURST.

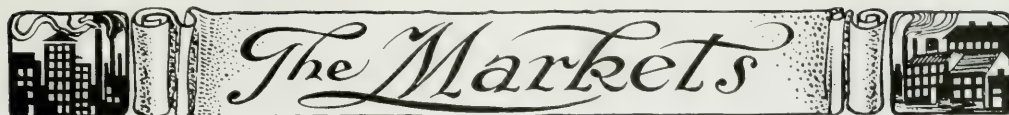
Mr. G. B. Steffanson, of the Canada Paper Co., Windsor Mills, Que., has been appointed chemical engineer for the Bathurst Pulp and Paper Co., recently organized to build sulphite mills at Bathurst, N.B. He will have charge of the design of these new sulphite mills. Mr. Steffanson is a Scandinavian, who has had an extensive experience in Sweden in building and operating sulphite mills. He has been in Canada about five years, and is well known to the readers of the Pulp and Paper Magazine, through his practical and technical articles. He will take up his new work at Bathurst on April 15.

A COMMERCIAL DAILY FOR MONTREAL.

MR. FIELDING, EDITOR.

The most interesting announcement of the most interesting newspaper situation of Montreal, was that made on Friday, by the Industrial & Educational Press, owners of the Pulp and Paper Magazine, the Journal of Commerce, and other technical journals, to the effect that the Journal of Commerce would be made a daily paper, with Hon. W. S. Fielding, as editor, and J. C. Ross, the present editor, as managing editor. The new journal will be very similar to the Journal of Commerce of New York, and will be a daily paper on Commerce in its broadest sense. It will deal with finance, insurance, markets, stock exchange, news and the general commercial and economic aspects of the country. It will also be a newspaper, giving in condensed form, world's news and the news from our own country. Murder trials, society news, and sporting pages will not figure in it, but it will be a broad-gauged, independent business man's daily news and commercial paper.

It will be published on the presses of the Industrial and Educational Press, Limited.



The Markets

CANADIAN MARKETS.

The market for news print is steady and all mills are well employed. It is generally admitted that, while the paper and pulp trade has been passing through a period of several months of quietness and smaller orders as compared with the great activity of a year ago, that the news mills have felt the depression less than any other branch of the business. Book and writing mills are fairly well employed, but business has not yet picked up to the extent which it was expected to, and orders are for the most part small, and contracts are fewer. The ground wood market is very quiet at present and prices are weaker. It is reported that some mechanical pulp has been sold of late at a considerably reduced figure. On the other hand the prices for sulphite pulp are firm and the stocks are low. The outlook for the coming year is also good, and one of the largest companies in Canada has already contracted for over eight per cent of its output during the present year, which is very satisfactory. The rag and paper stock market remains practically unchanged, and the only flurry has been a stiffening in the quotation for roofing stock. Paper houses report that business in their lines is picking up. January was a rather dull month after the holiday activity, but February witnessed a considerable improvement. In small quantities there is still considerable price cutting going on in fibres and manillas. The following quotations prevail, f.o.b. Toronto:

Paper.

News (rolls \$1.95 to \$2.00 at mill in car load lots.
News (sheet) \$2.15 to \$2.25 at mill in car load lots.
News (sheet) \$2.25 to \$2.75 at mill in less than car load lots.
Book papers (carload) No. 3, 3.75c to 4.25c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book paper (ton lots) No. 2, 4.50c to 5.25c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 6.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, \$2.00 to \$2.50.
Fibre, \$2.75 to \$3.50.
Manilla B., \$2.40 to \$3.50.
Manilla, No. 2, \$3.00 to \$4.00.
Manilla No. 1, \$3.25 to \$4.25.
Un glazed Kraft, \$3.75 to \$4.50.
Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood (at mill), \$15 to \$16.
Ground wood, \$21 to \$23, delivered in United States.
Sulphite (unbleached), \$42 to \$43, delivered in Canada.
Sulphite (unbleached), \$42 to \$44, delivered in United States.
Sulphite (bleached), \$56 to \$57, delivered in Canada.
Sulphite (bleached), \$57 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90.
No. 1 soft white shavings, \$1.75 to \$1.80.

No. 1 mixed shavings, 50c.
White blanks, 90c.
Ordinary ledger stock, \$1.15 to \$1.20.
Heavy ledger stock, \$1.40 to \$1.50.
No. 1 book stock, 70c.
No. 2 book stock, 45c to 50c.
No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
No. 1 print Manillas, 60c.
Folded news, 45c to 50c.
Over issues, 50c to 52½c.
No. 1 clean mixed paper, 30c.
Old white cotton, \$2.50 to \$2.75.
Thirds and blues, \$1.30 to \$1.32½.
No. 1 white shirt cuttings, \$5.00 to \$5.25.
Blue overall cuttings, \$3.50 to \$3.60.
Black overall cuttings, \$1.75.
Black linings, \$1.75.
New light flannelettes, \$4.50.
Ordinary satins, 75c to 80c.
Flock, 85c.
Tailor rags, 70c to 75c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
No. 1 Book, 5½c to 6c per lb.
No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less \$3.25.
B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
Kraft, \$3.75 to \$5.00.
Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
News quality, \$41 to \$42 per ton.
Bleached sulphite, \$54 to \$59 per ton.
Kraft pulp, \$3.60 to \$4.00.
Ground woods, No. 1, \$15 to \$16.
Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS.

209 Broadway, N.Y., March 13, 1914.

Chemical pulp has remained practically unchanged in the local market during the last two weeks. Importers have received large consignments, which were immediately shipped to paper mills to satisfy orders on old contracts. There has been some inquiry for new contracts in both bleached and unbleached sulphite, but few new contracts closed. Prices are unchanged, but the tendency is upward, and the general feeling is that values are now at rock bottom. Delays in the arrival of steamers carrying rather large consignments of sulphate and kraft pulp created a shortage of supply here, which was so low that spot orders of good size were impossible to fill. Although contract quotations are unchanged, spot orders have been commanding \$1.87½ to \$1.95 a hundred pounds. Reports from mills show that the past two months' production has been only a little below normal and the feeling is that pulp supplies have been pretty well used up. Consumption on old contracts is now about up to normal, and the next month will bring about an active wood pulp market.

The continued cold weather has prevented the grinding of wood in water power mills and shipments on old contracts as well as spot orders has greatly reduced the storage supply of mechanical pulp. The excess supplies at paper mills have, in practically all instances, been consumed and there is a fair demand for more stock. Spot orders are numerous, and it has been the desire of paper mills that deliveries be prompt. Such orders are commanding from \$22.00 to \$25.00 a ton delivered for No. 1, while No. 2 ranges from \$17 to \$19.50 a ton delivered. On new business there are practically no contracts for No. 1 below \$16.50 a ton at the mill. Old contracts in most cases are pretty well cleaned up and the next few weeks will undoubtedly reflect an active market with prices more favorable to the grinders.

Local importers of foreign rags have been a little busier with the balances of their old contracts which are now nearly wound up. There is a good deal of spot buying with orders for quick delivery which is taken as good evidence that there are only small supplies at the mills. Prices are very low and the range of new stock abroad is going down. The low grades are practically without inquiry. The storms of the past two weeks have caused great difficulty in the delivery of domestic rag stock which is now in a little better demand. Fairly good sized orders in the higher grades have been closed by the dealers at prevailing quotations. Roofing stock has been practically dead for several months but the last two weeks has shown some activity in sashmate garments at 1.10 to 1.15. The condition of the weather has prevented collections and it is the general opinion that this will influence the market in the near future as the accumulations which are being a little less the first of the year are now well out into and new supplies will be necessary with rather small collections to be drawn from. There has been a little softening in the prices of old jute bagging, but the other grades are fairly well maintained and the demand is a little better than the same time. Shipments of paper made practically ceased during the interval on account of the blizzard and snowstorms which occurred and tied up all branches of traffic. The national and international large sales into the public arena on the three day auction. Most activity was in newspaper but separately some new business was done in material. Soft paper savings have fallen off

in inquiry and the price is at inside figures. The amount for shipment has fallen in some cases from 100 to 35 tons or less a week. The lower grades are in better demand now which was the condition last year when mixed papers and old news were in strong inquiry and prices high. No. 1 mixed papers are commanding 40 to 45 while strictly overissue is quoted 67½ to 72½. As soon as deliveries can be made more freely still higher prices in the low grades are anticipated.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.

Ground Wood No. 2, \$17 to \$19.50, delivered.

Unbleached sulphite, domestic, 1.90c to 2.20c per pound, delivered.

Unbleached sulphite, imported, 1.75c to 2c per pound, ex-dock, New York.

Bleached sulphite, domestic, 2.80c to 3c per pound, delivered.

Bleached sulphite, imported, 2.60c to 3.05c per pound, ex-dock, New York.

Easy Bleaching sulphite, imported, 2.05c to 2.20c per pound, ex-dock, New York.

Unbleached sulphate, imported, 1.75c to 2.10c per pound, ex-dock, New York.

Bleached sulphate, imported, 2.60c to 2.80c per pound, ex-dock, New York.

Kraft pulp, imported, 1.80c to 2.00c per pound, ex-dock, New York.

Soda pulp, domestic, 2.10c to 2.25c per pound, delivered.

Paper.

Business in all lines in the local market was very poor during the interval on account of the severe snowstorms which has struck this section. Deliveries on old orders were checked and the trade was kept busy answering complaints from customers. Mail orders were few as trains carrying mails were delayed for many hours. Reports from New England showed that there had been a big rainstorm which greatly added to the water supply and eased power conditions which the cold has in some instances seriously tied up. The production of paper in all grades was about 90 per cent. of normal during the past two months and advices from producers show that at least 98 per cent of the production during January and February has been shipped. The local market in all grades has been firmly maintained with the exception of tissue which has been affected by a cut in No. 1 whites. Certain mills however refuse to quote less than 42½c. on 1000-ream and car lots. Orders of less than car lots are commanding 45c. to 47½c. A New York State mill offered what was claimed to be a No. 1 Manila to local trade at 40c. The price was considered too high and counter offers of 38c. were made for the paper which the bidders considered proportionately below a No. 1 Manila. No. 1 Manila is in fair inquiry at 42½ to 45 on less than 1000-ream and car lots and 40c. on car lots. Kraft tissue is in better demand and the price is firm at 47½ to 50c. Transient orders of roll news have been rather numerous at prevailing values. About all contracts for roll news have been closed at 1.95c, to 2c., f.o.b. mill. Sheet news has been in fair inquiry and the price has been firm. Side runs are now rather plentiful and the demand has been a little easier. Some cutting of the market price was reported in the interval and it is said that several orders were closed at 2c. against the market price of 2.05c. to 2.10c. Paper bags have been in poor inquiry and some cutting of prices in Boston, New York and Philadelphia has been reported. Shipments on the 1913 price list are

continuing in satisfaction of old orders which were made before the new list went into effect. Paper bag men on the whole are anxious to maintain the new price list and it is probable that the cutting reported in the interval is of only temporary nature. Writings, bonds, ledgers and linens are in fair demand and the higher grades are especially requested at prevailing prices. Book papers are in good demand and deliveries which have been slow were beginning to become easier until the storms which again set them back. Coated book is in softer tone although the market has been very active for the last few months. Kraft papers are still at very low prices and inquiry for them is rather slight, although new products have been designed since the first of the year and it is believed that a more active market is not far distant. Manilas, fibres and wrapping papers have been quiet, but prices are firmly maintained. New boards have been in good inquiry and the price is hardening, some manufacturers raising their value from \$30 to \$32, to \$31 to \$33 a ton. Straw boards have also been in good demand at prevailing quotations. Blotting papers have had a good month, producing about 92 per cent. of normal and disposing of 99 per cent. of this production. Toilet papers and power towels have had a fairly good demand but business is not up to anticipations. Cigarette papers are moving normally and are firm in price. Current quotations follow:

News, rolls, transient business, \$1.95 to \$2.05 f.o.b. mill.

News, rolls, contract renewals, \$1.95 to \$2.00, f.o.b. mill.

News, side runs, \$2 to \$2.10 f.o.b. mill.

News, sheet, \$2.25 to \$2.30 f.o.b. mill.

Book papers, car lots, C & S. C., \$1.00 to \$1.50 f.o.b. mill.

Book papers, car lots, M.F.S., \$3.75 to \$3.90, f.o.b. mill.

Writing paper superfine, 13½¢ to 17¢, del. east of Miss River.

Writing paper, extra fine, 11¢, del. east of the Miss River.

Writing paper, No. 1, fine, 9¢, del. east of the Miss River.

Writing paper, No. 2, fine, 8¢, del. east of the Miss River.

Writing paper, engine sized, 4½¢ to 8¢, del. east of the Miss River.

Bond paper, 5¢ to 24¢, delivered east of Mississippi River.

Ledger paper, 8¢ to 30¢, delivered east of Mississippi River.

Linon paper, 7¢ to 16¢, delivered east of Mississippi River.

Manila jute, 4½¢ to 5½¢, delivered.

Manila, wood, \$2.40 to \$3.00, delivered.

Kraft, No. 1, \$3.50 to \$3.75, f.o.b. mill.

Kraft, No. 2, \$3.25 to \$3.50, f.o.b. mill.

Boxboards, news, \$30 to \$33 per ton, delivered.

Boxboards, chip, \$28 to \$31 per ton, delivered.

Boxboards, straw, \$28 to \$31 per ton, delivered.

Wood pulp board, \$42.50 to \$45 per ton, delivered.

Tissue, white, cylinder, 40¢, to 45¢, delivered.

Tissue, fourdrinier, 47½¢ to 52½¢, delivered.

Tissue, jute Manila, 40¢, to 42½¢, delivered.

The annual meeting of the stockholders of the American Writing Paper Co., of Holyoke, Mass., was held several days ago, at Orange, N.J. Two new directors were elected, viz: Edwin Packard, of Brooklyn and

R. J. Burr, of New York City. The company elects six directors each year, the others being re-elected. The directors re-elected were W. N. Caldwell and Geo. B. Holbrook, of Springfield, Geo. B. Noble, of East Hampton, James G. Storow, of Boston and J. W. Ogden of New York. The new directors succeed W. E. Houston and the late W. H. Taylor.

Albert G. Durgin of the Chemistry Department of the University of Maine, read an interesting paper last week before his students on, "The Making of Paper Pulp." He traced the industry from its beginning which was long before the Christian era when all the labor was done by hand in a long and tedious process. "Soon," he said, "hot lime came to be used and as a result the industry spread through Persia, Spain, France and Germany, and, finally, 1600 years after the discovery of the use of wood pulp, it reached England. The first machine used in the pulp industry was used in 1843. In 1857 the first patent was secured for a pulp machine. After 1863 when the Sulplaid process was discovered the evolution of the industry was more rapid, until at the present time pulp and paper manufacturing is one of the five most important industries in the United States. Maine now leads in the industry with New York State second."

NORWEGIAN MARKETS.

Norway, Christiania, Feb. 21.—English buyers are still doing very little in either Mechanical or Chemical Wood Pulp. The tendency for Mechanical is rather uncertain; while it is maintained in some quarters that prices are firmer, others say that they are receding.

America has again bought Sulphite; one sale of 2,000 tons Easy Bleaching for America is reported and there are still enquiries from this quarter; other markets have also bought this week, but not England, and makers are satisfied with the situation.

Sulphate is hardening and after large sales in January makers have advanced their quotations.

America has commenced buying paper from Scandinavia and the paper market seems to be on the point of improving from the heavy depression under which it has suffered the last half year.

THE BRITISH MARKETS.

(Continued from Pulp & Paper Magazine.)

London, March 4, 1914.

There is an improved demand for newsprint in the British paper trade, and mills are being kept moderately busy supplying the consuming channels. Taking things generally there is a better feeling in the paper markets, and agents report that prospects are brighter now than was the case at the beginning of the year. Business, however, cannot be said to be in a flourishing state. In fine printings and writings a fair amount of trade is passing, particularly on export account, but prices obtained are still disappointing, owing to the increase in the cost of production. Wrappings, envelope papers, and other grades that are usually associated with "other kinds" of papers, are having a good outlet and everything points to a good time coming. There is no doubt the British paper mills want a good rush of orders to recoup them after the slackness that prevailed towards the latter part of 1913. In a large number of cases decreased profits have recently been reported and, of course, the keen competition amongst the mill-owners and the foreign makers makes it im-

possible to get an extra per centage on paper. One mill company in its 14th annual report says: "The directors regret that this year's report should be so unsatisfactory, but this is entirely due to the continued and largely increased manufacturing costs, owing to the rise in price of coal, all raw materials, and also to an increase in wages." Roughly, the British mills exported to Canada in February 113 tons 5 cwts. of printing paper; 4 tons 17 cwts. of writing paper; 8 tons 15 cwts. paper hangings; and 1 ton 18 cwts. of other kinds of papers. Canada exported 350 tons 15 cwts. of wood pulp boards to the British markets, which is a rough calculation in the absence of the Trade Board figures, which will appear in another week.

The sulphite and sulphate markets are very dull, and buyers are still doing little or nothing, though prices are easier. One or two deals with Swedish and Finnish mills have been closed at exceptionally low prices, which have somewhat upset the expectations of the Scandinavian mills. From Scandinavia comes the news that America is making enquiries in the markets there, but no big sales are announced. The German markets are also said to be dull. In England deliveries on running contracts appear to be arriving in rather large quantities, but this is no doubt due to the slight improvement in the paper trade. Prices are now about as follows, c.i.f. British ports:

Bleached Sulphite	\$56.40	to \$58.80
Easy Bleaching Sulphite (No. 1)	41.90	to 42.60
News or strong quality	37.20	to 37.80
Unbleached soda (No. 1)	36.90	to 40.56
" " (Strong quality)	36.60	to 36.90
Soda Kraft	38.40	to 38.70

The mechanical pulp position has changed very little, and business is not as brisk as makers would like it to be. The same state of things exists on the Scandinavian side. Prices now are:

Pine 50 p.e. moist, prompt (unwrapped)	\$9.60 to \$9.90
Pine, dry, prompt	19.20 to 19.50
For forward delivery add about half a dollar to above prices	

Since October last the market for Esparto has been steadily rising. The market is now strong, and sellers are in a good position to offer Spring shipments. Prices are firm with a tendency to reach a higher level in the near future. Indeed, it is a good many years since Esparto reached the high prices that are ruling at the present time.

There is a good demand for rags on home and export markets, and dealers report that they are satisfied with the current of business that is passing. During February about 121 tons of rags and paper stock were shipped to Canada.

The annual prices of small and large shipments are leaving for the States. Bleaching Powder is \$26.40 per ton, natural rock \$43.70 to \$44 for 76 per cent and 44 per cent and American Alkalis \$16.80 to \$17, according to quantity. Lime, clay is in great demand, while matches from other foreign ports all been closed for the

NEWS FROM NORTH EUROPE.

The Russian Government has forbidden the cutting of pulpwood of small dimensions in the province of Smolinsk. This will not only affect Russian mills on the Baltic coast, but also German and to some extent Norwegian mills.

The Oji Paper Mills of Japan have decided to build a 20-ton sulphite pulp mill in the new province of Sakhalin to be started in 1915. This is considered an experiment and large mills are expected to follow as Sakhalin is abundant in wood suitable for the manufacture of sulphite pulp.

The J. E. Engquist, A. B. of Tammerfors, Finland, have a 25-ton sulphite pulp mill under construction.

Mild weather indicates that the navigation in the Baltic will open early this year.

Four sulphate pulp mills, of 280 tons combined daily production, are under construction in Sweden.

A. B. Mo. Domsjo, of Hernosand, Sweden, have decided to increase their sulphite pulp production by 20 tons a day.

Several Swedish sulphite pulp mills have during the last year installed pyrite burners, these having superseded their sulphur burners.

Edward Lloyd, Ltd., have installed two more cylinders in their ground wood pulp mill at Vittingfos, Norway. Two further grinders may be added shortly.

The Sagbrugsforeningen, Fredrikshald, Norway, are installing three more pulp wood grinders each 600 h.p.

A. S. Skjaerdalen Bruk are contemplating building a sulphate pulp mill in Ringerika, Norway.

Another Norwegian ground wood pulp mill has closed down permanently; the power is to be sold for domestic purposes.

A. S. Rena Kartongfabrik have under construction at Rosvold, Norway, a 25-ton board mill.

A. S. De Forenede Papirfabrikkar of Copenhagen, Denmark, have under consideration the erection of a paper mill at Kjøge.

Der Gesellschaft fur Holzstoffbereitung, in Basel, Switzerland, have decided to erect a ground wood pulp mill in France.

The Spanish paper manufacturers have decided to decrease the production of their mills, owing to overproduction and low prices, and have opened a joint sales office in Madrid from whence the orders are distributed to the different mills.

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Pulp and Paper Magazine

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VOL. XII.

MONTREAL, APRIL 1, 1914

No. 7

Colonization and Paper Mills

A bill has been introduced into the New Brunswick Legislature by the Premier providing for a large colonization scheme in Simsbury and Queen's counties of that Province. An English syndicate will be granted 20,000 acres of Crown Land, which may be increased to 50,000 if desirable, to be split up into hundred-acre lots with 200 families to be settled within fifteen years. The idea, of course, to populate our country by desirable immigrants and other parts of the British Empire, is an admirable one, but it is a serious question whether the many schemes which have been proposed from time to time throughout Canada to settle people on lands which are better adapted to forest growth is advisable. The people from the other side coming out here under such provisions are planted without adequate assistance on these lands which they must clear and bring under cultivation. Past experience has shown that such colonization has always met with only partial success or absolute failure. About ninety per cent of those immigrants are always disappointed, having been led to believe rosy tales of a free country, which are usually true, but which they do not see through the perplexity of the initial struggle. Lands throughout the west are, of course, free from this objection, but many governments and individuals have made the blunder of trying to settle forest lands with these people, who are unfamiliar with the ways of this new country. The result is invariably that these settlers for two or three years burn up the country, clear their little patch of land and destroy a great deal of the surrounding forest, only to leave disappointed after a few years to join the mob of industrial workers in the large cities. The pulp and paper men are directly affected by these pro-

posals, for it is quite probable that history will repeat itself in these new schemes which are promoted, such as the one before the New Brunswick Government. There are 8,000,000 square miles of land in Canada, which is not adapted for anything else but growing timber. The forest reserves of our country are the largest individual raw material we have. Instead of depleting our forests to no end, it would be far better in most of these instances to encourage tree planting and scientific forestry and allow the land to produce its natural revenue of raw material at the large profits which are shown in France and Germany and not have semi-agricultural lands covered with discontented settlers and blighted hopes. This aspect of such schemes is usually lost sight of, but is very important, and should be well considered by lumber people and everyone interested in the welfare of the country.

The Two Cent Times

"The London Times," controlled largely by Lord Northcliffe, has reduced its price from 2d to 1d. This is a very significant fact to the newspaper trade, and as such has been commented upon throughout the world. "The London Times" is without doubt the leading newspaper of the world from all points of view and this giving way to a democratic spirit by reducing its price to the same level as other popular-priced papers, is another indication of the breaking down of aristocracy before the advances of democracy. It is stated that there never was such a demand for a newspaper as over this first 2c "Times," that the offices were besieged by newspaper agents who cannot be given more than one copy in ten of those ordered. This

paper controlled by the owner of the News mill in Newfoundland, is printed on Newfoundland paper, and there is no doubt that this reduction in price will mean a very large increase in circulation. This is another result of the benefits of the paper industry to civilization. The manufacture of paper is the only industry where in the face of higher cost of labor and raw materials is putting out cheaper product. This cheapening of paper has been the greatest boon to civilization, of any non-Christian influence. Of course, it is agreed that the price of news print is now the lowest it will ever be, but the difference in cost of white paper to the publishers at the present time, from what it was when the "London Times" used to sell for 12c, has made the wonderful development of Twentieth Century Newspapers possible.

A Short Talk to the Employee for the Employer.

An employee who allows himself to be overworked, lessens his value to the man who buys his services.

But there are at least two kinds of "overworked" people; to which kind do you belong? Think this over carefully, for your decision, and the action, based on your decision are vital factors in your success or failure.

The first kind of "overworked" employee is altogether too common, every employer of experience knows him, and is on guard against the fellow. He is the one who never reaches his work a minute ahead of time, and who watches the clock all day long for the sole purpose of informing himself as to how many hours and minutes more it will be, before the day's toil is done.

This rather worthless fellow is almost invariably a grumbler and is never satisfied. He shirks as much work as possible and, he is always beginning a new task in a heartless manner, as though it was a terrible penalty, the worst of these fellows being that their "shirk and discontent" is a disease, which is infectious. Gradually he produces in others the same symptoms as he himself has. The worklessness that he displays is soon evident in his companions. This fellow is the kind who is sure he is overworked, and that he is worth more to his employer than he is getting. He ought to be; otherwise where would the employer's profit come in? You who buy your services to others must always bear this in mind. Your employer must make some profit in his business; if he does not do this he cannot afford to remain in business.

If he pays you all the profit you earn, then he does not make a cent out of your services.

If an employee understands what he is about he determines to make a certain profit out of employing you.

With that idea of profit fixed in his head, he wonders if it is possible to grant you your request for an increase in your wages.

In all justice to both parties he should decide what amount is worth his services, and deduct from that a reasonable amount of profit that he wants for employing you.

The difference is exactly what your weekly salary should be.

The cry, "He's got a pull," etc., all leading to the cry of favoritism, is heard everywhere. As a rule there is very little cause for the charge. Of course, there are some employers who are guilty of showing undue favoritism, but those who do are soon failures, or the man higher up inquires into a few things, then a capable man is put in the favorites place.

It is often heard corporations have no souls. Why should they have? It is not their line. They are engaged in buying materials and services on which to make a profit. And they want just the kind of services that bring them in a sure and large profit.

The man who has such services to sell is always in demand, and at higher prices than are paid to the shirker. In this country there are hundreds of men working for these corporations, who receive higher salaries than the president of the United States. Why? Because they are men who produce results and are in themselves successes, and help to bring the companies for which they work on a higher plane of success.

It is the grumbler, the clock-watcher, who wants all he is worth without allowing his employer any profit who is slated to go, when any discharges are to be made. Don't go on looking for something in return for nothing, and don't expect all you are worth; allow the other fellow a share of your value in return for putting up the capital that makes it possible for you to be employed. Cultivate a sensible view of the question, live up to that view, and you won't be long in discovering that there is a larger balance between your value and the employer's profit. Do everything you do with a vim; do it honestly, as well as industriously. Don't be afraid of overworking, wherever you work; whatever the number of hours, work for all there is in it. Then you will find that your employer will give you all he can afford to do. And the man who is known to work without a watch, finds the securing of employment one of the easiest things in the world. Look for promotion systematically, and, quietly let your employer know from time to time that you are doing this. Don't take up too much of his time, discussing this subject with him, but continue to keep it in his mind that you are prepared with all your energies to demonstrate that you will be worth more money in a more responsible position.

GEO. MacLEAN,
Buckingham, Que.

A DURABLE PAPER FOR NEWSPAPERS UNAPPRECIATED.

As a result of a movement started by librarians in the United States to secure copies of daily newspapers printed on a quality of paper that would withstand the ravages of time, the Brooklyn Eagle printed an edition on paper containing 50 per cent. of rags for binding purposes. This has now been dropped. It appears there were only 14 subscribers, at an annual rate of \$15, a total of \$210. The paper cost \$2.367, the resulting loss being \$2.157. The librarians in the United States who deplore the deterioration of newspaper, and the future loss of all records, were found wanting when it came to paying an annual subscription of \$25 a year. It is not a question of not being able to secure a durable paper, but the indisposition of users to pay an equivalent price.

COPPER-FIGURE AND TRUE-ACID-FIGURE OF CELLULOSE AND SULPHITE.

ERICH RICHTER, D.Sc., D.E.

Among the reactions on cellulose or its substitution and decomposition products, for many reasons the reducing effect of them upon alkaline copper solution takes an important place. The reaction was first used by Vignon and later introduced as a quantitative test on cellulose of different kind and origin by Schwalbe. The latter has published many details and experiments about it, it appears to the writer, however, that the application of this method for investigation of chemical pulp, has hitherto not been well defined to its proper place and that, not denying its usefulness for many important technical questions, its value has been sometimes overrated. Having used the copper-figure method and its variations to some extent himself, the writer thinks it not out of place, to give his experience in this respect. Before entering into a detailed discussion, it will be of advantage however, to give first the method of determining the copper-figure as described by Schwalbe in *Zeitschr. für angew. Chemie* 1910 p. 925.

The degree of bleaching, expressed by the copper-figure, is determined in the following way—

2-3 grs. of substance, which is cellulose of any kind, is put in a hard glass flask of 1,000 cc. capacity, together with 200-300cc. boiling water and 100cc. Fehlings solution. Into the neck of the flask, which should be long enough, a cooler is inserted, fastened by a clamp. Any rubber or cork connection has to be avoided, because it has been found, that the condensing water will dissolve reducing substances from it, thus increasing the copper-figure considerable. The cooler is provided with a glass-tube in the middle, which goes all the way through, keeping a stirrer in its place. The apparatus being complete, substance and liquid are heated to boiling and kept at this temperature for exactly 15 min.

The cellulose material for this test should be weighed air dry, and the moisture tested in another sample, because if the substance used for the copper-figure is dried first the result obtained may differ from others, as cellulose products are liable to change their chemical nature upon heating. The stirrer should turn slowly, because if it runs fast, a funnel is formed in the liquid which draws air in. Air coming in contact with cellulose in hot alkaline solution oxydises more or less of the fibrous material, thus more copper would be reduced. Having boiled the substance for 15 min., residue and liquid are filtered through a Buchner funnel with filter paper and thoroughly washed with hot water. Care should be taken, that during filtering, cellulose and precipitate are always covered with alkali solution. The residue is then brought into a dish, covered with weak nitric acid (about 7 per cent.) and heated slowly. The precipitated copper-suboxyd generally dissolves fast. However, it happens occasionally, that a copper solution still remains with the fibrous residue. In that case, some strong ammonia is added first, acidifying again afterwards. The copper being in nitric acid solution, the metal is deposited from it, best by means of electrolysis. For exact experiments with this method, the reducing effect of the filter-paper on alkaline copper solution has to be considered. The author is of the opinion, however, that generally it can

be neglected. The more so, if not a large funnel is used for filtering, but a good-sized Gooch crucible. The filter is then so small in size and weight, that its contents of reducing substances need not be considered.

Among the many kinds of cellulose there are some, which absorb and reduce the copper solution at ordinary temperature. In fact, probably all technical celluloses do it to some extent. As there has not been found any regularity in regard to the absorption figures, in scientific investigations, these so-called Hydrat-copper figures have to be known. They are tested by inserting a separate sample of cellulose in cold Fehlings solution for about 45 minutes. The substance is then filtered off and washed as described above, but this time with cold water, until all excess of copper solution is removed. The residue is treated with nitric-acid again and the copper determined. To get the true copper figure, the Hydrat copper is subtracted from the one received when the material had been boiled.

Below an example, how to figure the copper test—

Copper-figure	100	Copper	Air dry cellul.
		Cellulose used	Dried Cellulose

Considering that it meant saving of much time and work, if only one kind of test had to be made on each sample, the author has endeavored to find out how much Hydrat copper was generally precipitated on Sulphite pulp. Six samples thus tested gave the following amount of copper per 1 gr. dry substance—

No.	Copper gr.	Hydrat- Copper Figure.
1	0.0020	0.20
2	0.0018	0.18
3	0.0012	0.12
4	0.0024	0.24
5	0.0030	0.30
6	0.0016	0.16

It will be seen that the Hydrat copper does not vary very much, and that for practical purposes the testing of it can be omitted, the ordinary copper figure alone giving a comparatively reliable picture of the quality of a sulphite pulp. Schwalbe found in 10 samples chemical pulp Hydrat copper figures from 0.22—1.15.

Some copper-figures as given from the same author are the following—

	Copper figure.	Copper figure.
Absorbent cotton	1.6	1.2
Absorbent cotton, mercerised	1.1	1.1
Mitscherlich Cellulose, unbleached	2.4	—
Ritter Kellner Cellulose, unbleached	2.8	—

I found on different samples of Sulphite pulp—

Sample No.	Copper-figure.
1	2.5
2	3.8
3	2.9
4	5.1
5	4.9
6	3.6
7	4.8
8	5.6

It now remains to explain, what the results mean under different conditions and with different materials. Schwalbe says, p. 625 in his book on cellulose, that the copper-figure is a direct expression of the degree of bleaching of pulp or cellulose, and p. 631, this is explained to be the degree, down to which the material has been freed from Lignin matters or impurities. This is, however, a mistake. The copper-figure never runs proportionally to the percentage of Lignin contained in the fibre material, at least not in chemical pulps. It may be, that with almost pure cotton, the copper-figure is in relation to the amount of impurities present, but as a rule, it cannot be used to test the degree of bleaching. In the following table, some of the copper-figures found with Sulphite pulps are given, together with the percentages on Pitch, Cellulose and Lignin.

	%	%	%				
Pulp No.	Ether pitch.	Alco. pitch.	Water ext'ct.	% Lig. % Ash.	% Cel. % Lign.	Copper-figure.	
1.	0.88	0.23	0.11	0.20	3.2	95.38	4.85
2.	0.65	0.21	0.71	2.07	4.9	91.46	4.0
3.	0.95	0.21	0.10	0.26	3.0	95.48	3.8
4.	1.12	0.13	0.12	0.32	3.1	95.21	4.86
5.	1.16	0.16	1.30	1.24	2.6	93.54	3.63
6.	1.14	0.16	0.26	0.35	2.2	95.89	3.82
7.	0.84	0.23	0.11	0.24	1.8	96.72	5.5
8.	1.01	0.17	....	0.20	2.0	96.58	5.7

It can be seen, that the copper-figure varies irregularly, certainly independent of the amount of Lignin present. The two samples with the least Lignin, No. 7 and 8 have the highest copper-figure. It can also be seen, that the last-named test is not in ratio with any other standard determination given in the table above. Having proved in work previous to this, that the percentage of Lignin actually gives the exact amount of impurities in extracted cellulose (1), the difference being pure cellulose, tested according to the somewhat modified method of Renker (2), it is obvious, that the copper-figure does not represent the degree of bleaching, but something different. According to Schwalbe, it also represents the amount of Hydro and Oxy-cellulose contained in a pulp sample. The first question would be therefore, which Copper-figure do we get with pure Hydro or Oxy-cellulose. The little table below will give an answer to this question:

Hydrocellulose.	Copper-figure.
1. Made from cotton satin with conc. Sulphuric acid	7.9
2. Made from cotton satin with Sulph. acid 45 deg. Be	3.9
3. Made from cotton satin with Hydrochloric acid gas	4.0
4. Made from Filterpaper	5.7
5. Made from Filterpaper	5.6
6. Made from Filterpaper	6.2
7. Made from Cotton	5.2
8. Made from Mercerized Cotton	8.8
9. Made from Parchment paper with 3 per cent Sulph. acid	8.7

Figures found, though with another method—3.

	Copper-figure.
Hydrocellulose	9.70
Cellulose precipitated from Copper-Ammon. Solut.	4.39
Oxy-cellulose	14.70
Starch	98.6

Above figures impress on anyone, first of all, that the copper-figure of Hydrocellulose at least, is not a constant figure, varying considerably with the material, from which it was made. It also varies with the method used, to produce the pure Hydrocellulose. The copper-figures on samples 2, 3, 4, 5 and 7 are no doubt too small, if we compare them with others, found on Sulphite pulp. Of course, it is hard to decide, whether the Hydrocelluloses mentioned above, have all been of a 100 per cent type or not, and most likely, they were not. It also may be, that different raw-materials give different kinds of Hydrocelluloses. Anyway, our present lack of knowledge in this direction, leaves an uncertainty in regard to the limits of the copper-figure which in turn, allow us to use it as a comparative test only.

So much may be said about this determination with relatively pure material; but with the copper-figure of chemical pulp, other points still have to be considered. Sulphite for instance contains a certain amount of lignin, whose nature and action on copper solution has not been explored thoroughly yet. The pulp also has always a certain quantity of Pitch, which can be extracted with Ether and Alcohol. This pitch will also reduce copper in Fehling's solution to some extent.

Since it is impossible at present to determine the influence of the Lignin substances on the copper-figure, we will at least try to find out what difference it makes, whether pitch is present in pulp or not. Some results of experiments may be given—

Pulp sample No.	% Ether-pitch.	Copper-figure.
1(a)	0.80	5.7
1(b) .....	....	4.9
2(a)	1.01	4.4
2(b) .....	....	3.4
3(a)	1.12	4.8
3(b) .....	....	3.8

In this table, "a" represents the unaltered pulp, while "b" is the same sample extracted with Ether, Alcohol and Water, previous to making the determination.

It can be seen, that the respective copper-figures vary considerable. Consequently, when testing the exact amount of reducing substance in Sulphite pulp, the pitch contained therein should be removed first. For technical purposes, however, it may be sufficient to know the copper-figure and the percentage of Ether-pitch of the raw material. So far as the author's experiments cover the subject, it seems, that the copper-figure of raw pulp is higher than that of the extracted Sulphite, by an amount about equal the percentage of Ether-pitch. It may be not always strictly correct, yet it will come very near the actual figure, and as it is frequently necessary to know the copper-figure as quickly as possible, a most simple method should be employed. In regard to Sulphite, the main thing would be now to decide, what does a high or low copper-figure mean to the paper maker and which is the maximum that can or should still be allowed. Through some study on this subject, I found a copper figure of 4.8, as being about the limit for raw sulphite, while 3.8

can be considered as the maximum for extracted cellulose. Any raw material giving values beyond the two named, should at least be looked over carefully, before it is used for paper.

We have seen, that the copper-figure represents the amount of reducing substances contained in a pulp or cellulose sample, more or less accurate. There is, however, another chemical or physical state of fibrous substances of this kind, which can be generally distinguished by a different action on organical dyestuffs, or a different ability to absorb them. Some experimentors have tried to classify cellulose substances accordingly, it has been shown, however, that this way is almost impassable at present, owing to the influence of the different and unknown physical nature of dyestuffs and celluloses. Schwalbe proposed to use a modification of the copper-figure for this purpose, and according to the author's opinion this probably serves the purpose best at present.

Schwalbe says, the degree of Hydration, that is the difference between Hydrolysier-figure and copper-figure is direct proportional to the ability of cellulose to absorb organical dyestuffs, or at least certain classes of coloring material. The Hydrolysier-figure is determined in the following way—(4a) 2.3 grs. of pulp are boiled for 15 minutes (4c) with 5 per cent. *ig.* Sulphuric acid. The latter is then neutralized with caustic soda. 100 cc. Fehlings-solution are added and the reduction determined in the same way as done with the ordinary copper-figure.

Some results obtained by Schwalbe are the following:

	Hydro- lysier figure.	Cop- per- figure.	Hydro- lysier per- difference.
Absorbent cotton.	3.3	1.1	2.2
Absorbent cotton, mercerized w. 8% caustic soda	3.2	0.9	2.3
Absorbent cotton, mercerized w. 16% caustic soda	5.0	1.3	3.7
Absorbent cotton, mercerized w. 24% caustic soda	6.1	1.2	4.9
Absorbent cotton, mercerized w. 40% caustic soda	6.6	1.2	4.9
Artificial silk	12.8	1.5	11.3
Viskose A	14.0	1.9	12.1
Viskose B	14.5	3.0	11.5
Viskose C	16.6	2.9	13.7
Chardonnet silk	17.7	4.1	13.6
Hydrocellulose acc. to Girard	6.6	5.7	0.9
Mitscherlich Sulphite, unbleached	4.4	2.4	2.0
Ritter-Kellner Sulphite, unbleached	3.5	2.8	0.7

Chr. Christiansen (5) found on soda pulp exclusively:—

Sample No. 1	7.3	1.1	6.2
Sample No. 2	8.0	0.6	7.4
Sample No. 3	10.0	0.6	9.4
Sample No. 4	11.9	0.9	11.0
Sample No. 5	7.9	0.6	7.3
Sample No. 6	13.7	1.3	12.4

(4a) Schwalbe, *Chemie der Cellulose*, p. 171 & 635.

(4c) Later on Schwalbe advised to boil 2 hours, with acid.

(5) Chr. Christiansen, *Schriften d. Verein, d. Zellstoff & Papier*—Chem. 1913.

While the author found on Sulphite, for instance:

	% Ether-pitch.			
Sample No. 1 A	0.8	5.0	5.7	—0.7
Sample No. 1 B . . . . .	...	5.0	4.9	0.1
Sample No. 2 A	1.0	6.4	4.4	2.0
Sample No. 2 B . . . . .	...	6.5	3.4	3.1
Sample No. 3 A	1.12	6.3	4.7	1.6
Sample No. 3 B . . . . .	...	6.3	3.6	2.7

In the last table, A represents the raw Sulphite sample, while sample marked B had been extracted with Ether, Alcohol and Water, before determining the Hydrolysier-figure and Copper-figure. According to the theory, sample 1 should not absorb organical acid dyestuffs, first of all, because its copper-figure is very high and denotes high percentages on Oxy- and Hydrocellulose, and second, because its Hydrolysier-difference is very small.

In the case of unextracted pulp, it is even negative, which of course is really impossible. With this particular sample, it is due only to the pitch, which does not act on the copper-solution, when it is boiled with sulphuric acid first, as done in the Hydrolysierfigure test.

Now this sample No. 1, is exactly a sulphite, which could not be dyed and sized with the ordinary amount of size, while the sample No. 2 was made and used in practically the same manner and in the same paper mill, without the least trouble.

From these and other experiments conducted later on, the above conclusions as to the permissible copperfigure of 4.8 for unextracted Sulphite have been drawn, and so far this limit has justified itself over and over again.

The copper-figure and its similar methods have been frequently the subject of detailed discussion and criticism. H. Jentgen, Vieweg and others tried to substitute some method for it, but as far as the author's experience goes, without much success. The copper-figure is an all around quantitative test and, carefully applied and used, will enlighten our knowledge on cotton products as well as on other celluloses, like Sulphite, Soda-pulp, artificial silk, etc. In regard to its applicability as a technical test, it has the deficiency of being rather slow. It is often highly desirable to know the sizing and coloring quality of Sulphite at once. In that case the copper-figure test would not do the work quick enough. The author tried at various times to replace this determination on Sulphite by a shorter one, but with little success, until an old standard method of the Riordon Pulp and Paper Co. was investigated thoroughly in this respect. This standard test had been introduced by the writer, some time before above determinations ever had been made, and at first it did not seem to have anything to do with the Copper figure or its meaning. The results, however, soon proved a rather close connection, at least in regard to the final result.

To make the following description of this new method well understood, I may be allowed to give the history of this test briefly.

One day, complaints were heard about a certain kind of pulp. It was claimed the Sulphite was not well washed and contained too much free acid, thus causing trouble for the papermaker. Through the courtesy of Mr. Thorne, the writer had the opportunity of visiting the Sulphite mill as well as the paper mill, which enabled him to draw his conclusions independently and to take a fair sample of the material in question.

The first and most surprising thing that appeared to the writer, when trying to determine the free acid in cellulose, was the entire lack of well proved quantitative methods to test it. The second impression was, that the total amount was generally very small. After some study, the following method was found to give good results—

5 or 10 grs. of air dry Sulphite are broken up in thin pieces, put in a hard glass flask (6 oz. bottle with glass-stopper, together with about 100-200 cc. of hot water (60-80 deg. C.). The bottle is then shaken vigorously (taking care, that the heated air escapes the first few times the bottle is moved), the water filtered off with a hard glass funnel by means of a little plug of pure absorbent cotton. Bottle and substance are washed two or three times again with hot water.

To the entire aqueous solution a few drops of Jodine-cosine or Rosolic acid as Indicator are added, and the whole thing titrated with 1-100 normal caustic alkali, in case it reacts like an acid, or with 1-100 normal Sulphuric acid, should it be alkaline. The free acid thus found in Sulphite, for convenience was given in grs. Sulphuric acid per 1,000 grs. of pulp. Some determinations made, gave the following result:—

Sample No.	Grs. H ₂ SO ₄ per 1,000 grs. Pulp.	% Lignin.	% Ash.
1	0.19	4.3	0.83
2	0.06	5.2	0.59
3	0.07	4.6	0.46
4	0.07	3.0	0.31
5	0.09	3.7	0.27
6	0.14	5.2	0.72
7	0.09	7.4	0.92
8	0.13	5.2	0.38
9	0.10	...	0.96
10	0.29	7.9	0.74
11	0.39	9.1	1.29
12	0.07	3.5	0.34
13	0.06	2.8	0.35
14	0.08	...	0.59
15	0.03	4.9	2.07
16	0.05	2.3	0.18

With the above samples the Lignin and Ash test were made, because it was thought, the free acid might be in ratio with either one of them. This, however, is not the case. Some of the Sulphites had been made in Europe, and some on this Continent. Practically no difference can be seen.

Mill tests, made continuously in a Sulphite plant, give some of the following values:—

True Acid-figure.	% Lignin.
0.08	2.9
0.12	2.8
0.09	3.6
0.11	3.8
0.02	3.0
0.06	3.2
0.10	2.9
0.09	3.0

More tests were made in other mills, but there could not be found any connection between any standard test known, and the so-called "True Acid figure."

The best thing to use in this case, is a flask of water and Sulphite.

When looking over the results given above, one will discover that the free acid varied between rather wide limits and that it came sometimes very near the neutral point. It was, therefore, a subject of much interest and consequently research, to see whether any Sulphite could be found, that was absolutely neutral or even basic character, or not. When that sample turned up, which could not be dyed and sized, the author tried the true acid-figure with it, and was much surprised to find it decidedly and rather strongly alkaline. On an average, 5 grs. of pulp used 1.0 cc. of 1-100 normal Sulphuric acid, which amounts to —0.098 grs. Sulphuric acid per 1,000 grs. pulp. Considering that the Sulphite pulp is manufactured with an acid, and that on the other hand, as is well known, any cellulose will absorb and strongly retain mineral acid, more especially volatile kinds like Sulphurous acid gas, it forces one to think, some peculiar reaction must have taken place with that pulp. Obviously this must have been during the cooking. Some practical experiments along this line with a little experimental digester proved it as the right theory. Any pulp kept boiling for too long a time, with even very weak acid, gave a high copper-figure and reacted either neutral or alkaline, if tested for the true acid figure.

Having found a connection between the cooking process, the copper-figure, true acid-figure and the dyeing and sizing qualities of Sulphite, it was comparatively easy to find some more samples, from different mills, which would allow to widen the experience, by showing a deficiency, either when dyed or sized. Some of the results may be given:—

No.	True acid figure.	Copper- figure.	% Lignin.	% Ash.	Remark.
1	—0.06	4.96	2.9	0.78	Hard to size.
2	—0.08	4.88	3.1	0.20	Hard to size.
3	0.00	4.85	2.6	0.27	All right.
4	0.00	5.00	2.2	0.90	All right.
5	—0.12	5.00	4.6	0.80	Hard to size.
6	+0.10	3.60	2.6	0.68	All right.

From the above it can be seen, that it is necessary for good Sulphite to react like a weak acid under the circumstances, under which the true acid figure test is made. Of course, this does not explain the why and wherefore of it. Whether the impurities or the cellulose itself are the causes for this acid reaction or not, we can not decide definitely. The occasional detection of alkaline Sulphite seems to suggest, that at least the latter reaction is brought about by the cellulose substance itself. Which ever way it may be, the experiments prove, that the free acid is in close relation to important papermaking qualities. As an advantage of the method, it is to be claimed, that a determination can be made in a few minutes, and that a neutral pulp gives a natural limit. Anything below the zero point can be considered as troublesome for the papermaker, if he uses the Sulphite unaltered.

In case the pulp is bleached first, the hard sizing and coloring disappears, of course, but the natural consequences are, that some more bleach liquor is used, and that more fibre material than usual is lost in the operation, owing to the oxidising qualities of chlorine, acting upon the alkaline Sulphite much stronger than on any other. Another thing, which is of advantage with the true acid figure, and which is frequently overlooked with other tests and methods, is the rather large sample that can be used conveniently. With the copper figure, 2.3 grs. only are available for this purpose,

while here it makes no difference, whether 5, 10 or 15 grs. are used. Even with as much as 10 grs., the sample of a whole digester has to be taken carefully, in order to reach the average; but with 2-3 grs. it is infinitely much harder to get the same result. At least two copper-figure tests have to be made in most cases, and from experience, the writer can tell, that with Sulphite, often as many as three did not seem to suffice. The advantage of the copper-figure lies principally in the fact, that it is an all around method, for any kind of cellulose, which, of course, cannot be said from the true acid-figure at present. Yet it may be, that some experiments with a number of soda, sulphate and other pulps, may prove its adaptability to different conditions. At the same time the true or free acid-figure will give results, of course, which refer to certain qualities only, while the copper-figure in connection with its variations, allows a number of other conclusions, although even so, we are still often at large, as to the exact meaning of it.

Some other copper-figure tests made on Sulphite some time later, may be interesting in connection with this chapter, although there is no direct relation with the experiments described above.

Schwalbe, in his book on cellulose makes the remark, that the Hydrolysier-figure and copper-figure may change in pulp run over a drying machine. The respective determinations were made by the writer with the following results:

Sulphate from—	Hydrolysier-figure.	Copper-figure.
Vat	4.6	4.7
10th Dryer	5.05	4.63
Last Dryer	5.43	4.37

All tests were made double and the samples taken as the pulp ran over the machine, so that they were all ways cut from about the same place of the sheet. We can see, indeed, a continuously increasing Hydrolysier-difference, and a decreasing copper-figure, owing to the influence of the temperature.

Another chapter of cellulose and papermaking practice that would be interesting to investigate and whose results should be beneficial to the industry if the research is done thoroughly, is the application of the methods described above on the bleaching processes of technical celluloses. As far as the writer knows, not much, and partly no work at all has been done in this line yet.

EAST CANADA PULP CO.

Messrs. J. T. & C. Donohue have purchased all the stock of pulpwood formerly belonging to the East Canada Pulp Company, Limited, at Murray Bay, now in liquidation. The wood is in the yard booms and also on the company's limits, on the Murray River and its tributaries.

The purchasers have also acquired the new pulp mill. It is estimated that some three hundred hands will be employed. Montreal Trust Company, who are liquidators, report that they are encountering many difficulties in winding up this estate, owing to the numerous liens which are claimed on the pulpwood, also on account of the fact that having been cut on Crown land it is impossible to ship same before being manufactured into the United States. Recently, however, they secured the consent of the various lien holders to a sale of the wood by tender. Times, March 21st.

wood by tender.

Steel Belt Power Transmission

(From Our London Representative.)

In England there is a very interesting investigation being carried out into the use of steel belts for power transmission in paper and textile mills. I find that these belts have to a great extent replaced cotton rope drives in a number of important applications, and also leather, and an inexpensive method of conversion has been devised whereby the conversion of a complete rope race can be undertaken on a Saturday mid-day and be completed with the steel belts ready for running for the following Monday morning.

According to one well-known authority on the subject, Mr. Bernard Kruger, of Manchester, the conversion usually increases the horse-power available at the driven shaft by 7 to 25 per cent and he says that assuming that the necessary conditions could be fulfilled, steel belting transmission is guaranteed to give the following advantages:— (1) An efficiency in power delivery of 99 to 99½ per cent, as against a loss of from 4 per cent to 15 per cent in straps and 6 per cent to 25 per cent in ropes. (2) Great Steadiness—a necessity for paper mills. (3) Favorable use of space. The distances of pulleys are optional to a great extent, depending on the speed; a perpendicular drive is no disadvantage for steel belt driving. (4) Absence of stretching. A steel belt does not stretch by use, as has been shown by five years' experience. (5) Even running and freedom from slip. Transmission by steel belt is uniform and invariable. (6) Narrower width. A steel belt is only about one-third as broad as a corresponding leather belt, consequently the pulleys would not cost so much. (7) Greater power under present conditions. In cases where the pulleys are limited in size it is often possible to get an increased power transmitted by the use of steel belting without any rearrangement. (8) Good bearings. (9) Cleanliness. (10) "Unwearability." Steel driving belts have now been in operation for six years, and tests made of the belts used at the first showed no signs of deterioration. It seems evident that the life of a steel belt is unlimited.

Dealing with the cost, Mr. Kruger says that owing to each steel belt-drive being priced on its own individual merits and conditions, it is not possible to give a statement of prices in the same manner as would be applicable to belting or ropes. "I give," he said, "particulars of a drive in which the costing has been calculated as against an equivalent drive by ropes and leather. The comparative initial cost, if new installation, is:—Ropes \$1,152, leather belt \$1,176, and steel belt \$864.80. The minimum loss of power given with ropes and leather belting as against a maximum loss given by the steel belt and worked out on a financial basis showed the loss to be:—Rope \$324 per year, leather belt \$216 and steel belt \$27." Mr. Kruger added that there is no question as to the practical success of the Blosser system and it could no longer be considered to be in the experimental stage.

Recently a great deal of interest in paper and industrial circles has been manifested in this steel belting, and from what I can see and hear, I believe we are on the right to success now in adopting a system of steel belting for power transmission. Manchester and Lancashire men are elated over it.

FOREST OWNERSHIP AND FIRE PROTECTION

Are Timberland Holders Doing their Share?

By G. E. BOTHWELL.

The annual value of Canada's forest products has been estimated by Mr. Campbell, the Dominion Director of Forestry, to considerably exceed \$170,000,000. Although the larger portion of this revenue is derived from Crown timber lands in Canada, only a very small percentage ever finds its way into the public treasury. Yet in the maintenance of the wood-capital on the immense areas of otherwise unproductive land in Canada by protecting present and potential forests from fire, it is the Government which bears the greater part of the cost, and also of the censure. Although the most valuable timber areas in Canada are now under licence, it has been necessary in almost all cases to employ legislative stimulus in order to induce timberland owners and licensees to share the responsibility for forest fire protection. Whether even yet they are doing their share may best be judged by ascertaining just what they actually do in the matter of forest fire protection in comparison with the extent of their holdings in the various provinces.

In Prince Edward Island the wooded area does not exceed 5,000 acres—less than one per cent—and is mostly in the form of farmers' woodlots, the value of which, in a province so largely agricultural, ensures their adequate protection when supplemented by a law penalizing carelessness with fire.

In Nova Scotia however, conditions are reversed for the farm area is less than twenty per cent. A similar percentage is barren, due to repeated forest fires, and of the approximately five million acres of green woodlands, less than one hundred thousand acres is virgin timber. Practically all the valuable timberlands are in private hands, it being estimated by Mr. Whitman, a prominent Nova Scotian lumberman, that 2,500,000 acres belong to private owners, 1,864,000 acres are held in "fee simple" by lumbermen, while 1,500,000 acres remain to the Crown. Of the Crown lands only 5,297 acres are at present under licence, the remaining acreage being largely burnt over or barren.

Probably nowhere else in Canada has greater damage been done by forest fires and under existing conditions of ownership it became necessary to secure recognition of the principle that a tax for fire protection should be borne by those whose property is protected, in direct proportion to its area or value. Consequently, a tax of a quarter cent per acre was imposed by the Government on all holdings exceeding 500 acres, and with the sum thus contributed by the lumbermen and timberland owners, the Government maintains a protective patrol which has materially reduced the fire danger in the province.

In New Brunswick there are approximately 7,750,000 acres of Crown land, 3,000,000 acres of settlement land and 4,750,000 acres of private timber land. Of the Crown timber lands 488,100 acres are now under licence and of but approximately 400,000 acres will be taken up immediately under the new timberlands act. The unprotected area has been either badly burnt or barren, and although, generally, all a valuable timber is protected, even the fire protective patrol, such as it is, has not been fully supported by the Government. On some badly burned tracts a protective patrol is main-

tained by timberland holders as it is not required by law. To overcome this inertia and prevent the recurrence of the Miramichi disaster, when 2,500,000 acres were fire-swept in Maine and New Brunswick, and 160 lives lost, the Government is considering the levying of a fire-tax based on the dollar value of private timberland holdings, a plan which has worked successfully in the State of Maine.

In Quebec there are 44,686,080 acres of timberland under licence, although this enormous area is little more than one-quarter of the total area of the Crown timber lands in this province. But very little of the unalienated timber is of any present value, due to its size and its inaccessibility. Consequently no attempt is made to protect from fire the greater part of the area remaining to the Crown. But timber licensees are legally supposed to protect the valuable stands of timber on the areas under licence, by providing suitable patrol at their own expense, subject to the supervision of inspectors appointed and paid by the Government. Prior to 1913 there was much evasion of this regulation, and to prevent this a law was recently passed imposing a penalty of five dollars a square mile for non-patrolment of limits. Even then many of the limit-holders preferred to pay the fine and trust to luck in the matter of fires, rather than comply with the Government's requirements. There are, however, some conspicuous exceptions where these requirements are exceeded, the most striking being the St. Maurice Fire Protective Association, composed of a body of Quebec limit-holders who have co-operated to secure adequate fire-protection on their joint holdings of over 7½ million acres. By taxing themselves one-quarter of a cent per acre they have perfected their patrol and have also installed telephone lines and look-out stations which, when the system is complete, will effectually eliminate any danger from forest fires in the areas so guarded. There are other river-valleys in Quebec where co-operative protection is equally feasible, and it is not surprising that Mr. W. C. J. Hall, Superintendent of the Forest Protection Branch, wonders what the limit-holders are thinking about who prefer to pay a fine of \$5.00 per square mile with no protection whatever, rather than co-operate to secure absolute protection from fire at a self-imposed cost of only \$1.60 a square mile, as paid by the limit holders on the St. Maurice River.

In Ontario, there are approximately 65½ million acres of forest lands, of which 11,782,400 acres are under licence. The regulations for the protection of the timber on these areas are very similar to those of Quebec. The limit holders being required to pay the entire cost of the patrol of their limits. In Ontario, however, no evasions are tolerated by the Government. As one man per township is usually deemed sufficient patrol, the burden is not a heavy one on the licensees for the Government supplies the supervision, the office work and the fire posters, etc., which are needed. Moreover once the merchantable timber on a limit has been removed, the limit holder is not usually required to continue the maintenance of this patrol, thereby leaving exposed to fire all the young growth which, although of little value to the lumberman who is concerned only with the present crop, is of considerable

great potential value to the Government which deals in futures. Last year the limit holders in Ontario paid approximately \$92,000 for fire-protection, or little over half a cent per acre of licensed areas. The cost to the province of fire-ranging on adjacent areas was \$233,000, yet the revenue derived by Ontario from Crown Timber lands, substantial though it may seem, is not to be compared with the profits accruing to the exploiters of the timber on these Crown lands.

The Crown Timber lands in the prairie provinces and in the Railway Belt in B.C., are all administered by the Dominion Government. The area of actual timber land is comparatively small being about 15½ million acres of which 5,360,600 acres are under license. There are, however, vast areas bearing wood suitable for pulp, estimated to total 42,000,000 acres, which, because of the high cost of bringing the product to market, are practically valueless at the present time. But these pulp-wood resources have a high potential value, and must be protected wherever the proximity of man increases the likelihood of forest fires for the great majority of fires are due to carelessness with fire. The cost of protecting these areas is entirely borne by the Dominion Government, and even on the timber limits where a great many of the fires originate, the patrol is maintained and administered by the Dominion Forestry Branch, the limit-holders being only asked to pay one-half the cost of such patrol, the size of the contribution depending on the area of their holdings.

In British Columbia it has been estimated that there are 100,000,000 acres of woodland of which, according to a B.C. Government forester, "upwards of 65,000,000 acres may be regarded as actually, or capable of, producing merchantable timber." Of this area, 1,500,000 acres are privately owned, 1,000,000 acres are under timber lease and 8,500,000 are under license. The remainder is, as yet, unalienated. To protect from fire the more endangered portions of these areas is the work of the Government, but to provide funds a contribution of one and one half cents per acre is required from the limit-holders. To the total amount thus received the Government adds an equal sum. As a large portion of the fires originate in the logging debris on cut-over lands, the B.C. Fire Law stipulates that a fire-line be cut around such dangerous areas. This regulation is seldom enforced, however, for the lumbermen realize the danger from logging slash, and if possible, pile and burn it while conducting logging operations.

It would appear then, that in three provinces, Nova Scotia, Quebec and Ontario, the expense of the "soudisant" patrol of private timber holdings is borne entirely by the licensees. But in Nova Scotia the municipalities have frequently to bear a share, in Quebec the responsibility may be evaded by payment of a fine, and in Ontario cut-over lands are usually exempted from patrol. In the four western provinces, timber limit-holders are required to pay only half the cost of protecting their timber from fire. In New Brunswick the limit-holders are not taxed at all and in Prince Edward Island there is no need of taxation for fire protection. It must be remembered too, that in all cases the government supplies the office administration, the field supervision, and sometimes even the equipment of these patrols.

It has been estimated by the Hon. W. A. Charlton, himself a lumberman, that of the \$1,500,000 annually spent by Canada in forest fire protection, the lumbermen and railways together contribute only \$500,000.

It is but proper that the railways should share the cost at least equally with the lumbermen, for as Mr. A. L. Flewelling, President of the Western Forestry and Conservation Association, recently stated, the transcontinental railways "actually have a greater monetary interest in the result of forest fires, than the man who really owns the trees and pays the taxes thereon." It is hardly proper, however, that so little of the total cost of fire protection should be borne by the railways and lumbermen for it is largely the fires escaping from railroad rights-of-way and from cut-over lands which necessitate protective patrol on the adjacent Government timber lands. They should certainly bear the entire cost of fire ranging on their respective holdings and should also be made more strictly responsible for all damage to adjacent areas through negligence in fire protection.

It is hard to understand the ridiculously sublime indifference of many lumbermen to the necessity of fire protection when forest fires destroy yearly in Canada from twenty-five to one hundred million dollars' worth of timber. A large percentage of these losses are on licensed land where the Government loses only the stumpage dues, whereas the licensee loses his entire timber capital, and often also his camps and equipment. The reality of the fire risk is best indicated by the fact that it is impossible to obtain insurance on standing timber in Canada.

Trusting to luck to escape from fire loss may have been to some extent justifiable when forest areas were only logged-over once and then abandoned, but the modern tendency is towards large holdings and continuity of logging, thus permitting the more economic handling of the logs and the building of fully-equipped modern mills where waste may be reduced to a minimum. In such cases, carelessness is criminal. In Canada the large pulp and paper companies with their immense holdings and costly mills, find it absolutely necessary to protect their forest resources from fire in order to ensure a sustained annual cut of pulpwood. Several such companies on the St. Maurice River, Quebec, by a co-operative arrangement with adjacent timberland holders have formed a protective Association which, as previously pointed out, has secured immunity from fire on practically the entire river-valley. The patrol is organized, administered and paid for entirely by the Association, save that the Quebec Government contribute a sum equivalent to the fixed assessment, on such of its lands as receive the benefit of the patrol. In 1913 over 275 fires were extinguished by the Association's Rangers with practically no damage to standing timber. In the words of Mr. Ellwood Wilson, a member of the Association, "The success of co-operative forest fire protection has been established beyond doubt."

Although the first of its kind in Canada, there are at least thirty similar co-operative organizations in the United States with a total patrolled area of 25,000,000 acres. They did not arise through Government coercion, but rather through economic necessity for the recent abnormal rise in the price of stumpage in the United States—it has doubled in the last seven years—has made it advisable from a business standpoint to protect not only the mature timber but the young potentially valuable timber on the cut-over areas.

The same rise in stumpage value is manifest in Canada, and it is only a matter of time before the lumbermen relieve the government of the responsibility of protecting their limits from fire. The advantage accruing

to co-operative fire protection are so self-evident that their mere citation will suffice. Low cost through economy of administration; elimination of governmental interference; reduction of danger through increased responsibility; ultimate elimination of danger through the perfecting of a fire-protective system; these are but a few of the most obvious advantages. Moreover, with the fire-danger reduced to a minimum it then becomes possible to secure insurance of forest property as well as loans based on standing timber values, for in those parts of the United States where the danger from forest fires is negligible, timberland bonds have already been issued to the value of \$150,000,000. Also when the safety of his timber is assured, the landowner can then afford the economy of practicing scientific forestry.

It is evident that at the present time the timberland owner in Canada is hardly doing his share in the matter of forest fire protection. But it is also evident that the more he shirks the responsibility the quicker he will have to assume it, for fire, probably more than any other single cause, has been responsible for the abnormal rise in stumpage values, and as these values continue to increase, the timberland holder will be forced by business necessity to protect his timber from the chief cause of its value increase. When the change takes place, as it will, within the next ten or fifteen years, the Government need then concern itself only with the protection of the timber lands it itself administers. But meanwhile, fire continues to consume Canada's millions in timber-wealth.

ASH OF SULPHITE WOOD PULP.

Writing on the ash of sulphite wood pulp, E. Richter, in a recent issue of *Der Papier Fabrikant*, says: The ash of sulphite cellulose rarely exceeds 1 per cent., and is more frequently about 0.5 per cent., calculated on dry substance. The proportion of silica is usually almost exactly one-third of the total ash, even with relatively large variations of the latter. The quantity of silica in the original wood is very much smaller than in the sulphite pulp, and it is probable that the silica is fixed by the fibre in the form of a calcium or magnesium silicate during the digestion process. Taking as a typical instance a Scandinavian pulp containing 0.50 p.c. of total ash and 0.18 p.c. of silica, it is calculated that in the course of 100 digestions, producing 10 tons of cellulose per charge, 1,800 kilos of silica must have been taken up by the fibre. Such a quantity could not possibly be all derived from the lining of the digester, and must probably it comes mainly from the bisulphite liquor. The quantity of iron in the ashes of various pulps ranged in the series of examples examined from 1.4 to 9.2 milligrammes per 100 grammes of ash. The quantity of iron, however, shows no regular relationship either to the total ash or to any other character of the pulp. The ash constituents of the wood appear to have little or no influence on the percentage of ash in the pulp. This depends rather on the composition of the digestion liquor and the manner of digestion. For instance, two varieties of pulp made from the same wood and using the same bisulphite, but with liquors containing different proportions of combined sulphur dioxide, showed in the one case an average of 0.45 per cent. of ash and in the other 0.65 per cent. Thus as a general decrease in the percentage of combined sulphur dioxide in the liquor, increases the ash in the pulp. It is probable that these circumstances are not directly connected, but that both of them depend on the method of digestion.

Forest and Pulp Industry.

Continued from last issue.

Aside from the new woods that are coming into use there is still another tendency which is becoming marked in the pulp industry; namely, the use of slab wood and other mill waste. In 1907 the amount of slab wood used was only 193,000 cords; in 1909 it amounted to 250,000 cords. The report for 1908 shows that nearly all of this material was slabs from the sawmills, though small quantities of shavings entered in. Spruce and hemlock supply most of this material, while the remainder was chiefly pine. What utilization there has been is, therefore, of a class of material of which an enormous supply exists. There will be no limit to the movement on account of supply. It is far in excess of all immediate requirements. Taking into consideration only spruce, hemlock and yellow pine, the total production of which in 1907 was 18,315,000 M feet, and assuming one-fourth cord of available waste material to every thousand feet of lumber, we would have approximately 4,580,000 cords of available material. If conditions for the use of such material become favorable, it appears reasonable to believe that one-half cord of such material could be so utilized. That would give 9,160,000 cords, more than double the total pulpwood now required, and over one-half the assumed demand in 1950.

But the three woods which afford the basis for this calculation furnish less than half the total production of lumber. If the mill waste of the remainder could be used in the proportion, it would amount to more than 18,000,000 cords of available material.

While many other woods will undoubtedly eventually find a place in the making of pulp and paper, and mill waste will add considerably to the available supply of pulpwood, yet it is of vital importance for the pulp industry to have large spruce forests. Therefore, hand in hand, with the increasing use of new woods, and the greater utilization of the waste product of our sawmills, there must also go on the improvement of the present spruce-bearing area. Not merely protection from fires as a means of encouraging the young growth, not merely a closer utilization of the present timber, but an actual increase of the forest area, reforestation of the denuded and burned-over land. For the production of pulp it is advantageous to use small and comparatively young timber. Old timber is often brush, and does not yield as firm fiber as wood from younger trees. It need not, therefore, take centuries as in the case of lumber production, to grow timber for pulp. In Norway and Sweden, whose forests in many respects resemble our Maine woods, and which are now the source of the pulp supply of entire western Europe, the advance of the pulp industry marked a decided improvement in the condition of the forest. It made possible thinnings of the suppressed and poorly developed trees in young stand, thereby increasing the growth of the remaining trees; it increased the value of the smaller timber which has been found more suitable for pulp production; and it brought within possible economic realization the actual growing of timber for pulp. Since small timber is just as suitable as old timber for pulp, if not better, it can be grown on a rotation from 40 to 60 years, which brings artificial forests within the realization of large pulp companies. Our red spruce is not so fast growing as the Norway spruce in Europe, but even it, with proper handling and timely thinnings, can be made to produce a stand that would cut in 80 years about 2,000 cubic feet or about 12,000 board feet or 24 cords, a growth of about

one-third cord per year, a very conservative growth compared with the timber production in European countries having a climate and soil similar to our Northeast. Even at such a rate of annual increment the 20,000,000 acres of spruce-bearing land in this country, under proper handling, could be made to yield an annual increment of about 10,000,000 cords a year. This increment could be probably still further increased if, instead of the red spruce, we would grow the white spruce, or what is generally known as the "cat" spruce, very common on old fields in Canada and in some portions throughout Maine and the Adirondacks. The growth of the white spruce compares favorably with that of Norway spruce and, being a native species of this country, is probably better adapted to the climate and soil of North America.

Norway spruce reaches a diameter of about 11 in. and a yield of 38 cords in forty years.

White spruce will reach a diameter of 11 in. and a yield of 38 cords in forty-five years.

Balsam fir will reach a diameter of 10 in. and a yield of 30 cords in sixty years.

From these figures you may see that forestry is, after all, not so much a chimerical undertaking, and that in view of the growing demand for pulp and the unquestionable use of wood for pulp, it is even a feasible undertaking for private individuals, especially if they are corporations having heavy investments and a long life.

Of course, this conversion of the present wild woods into dense young stands of white, red, or even Norway spruce, even if begun now, could not be accomplished in a few days. If begun now, however, while there is still a large supply of timber which is gradually coming into use as pulpwood to help out the dwindling supply of spruce, such as balsam fir, there would be enough timber to tide us over until the planted timber would come to maturity.

To sum up: If the adjustment of the pulp industry to the wood supply will take place along the lines I have attempted to sketch out here, there would eventually be brought about material changes in the industry.

In the first place, it will cause an expansion of the industry beyond the regions now chiefly occupied. Time was when the industry centered almost exclusively in New England and New York, then a new center appeared in Wisconsin, and more recently production has been growing rapidly on the Pacific Coast. If new woods are to be utilized, the tendency to expand must go much farther than it has. To what extent this expansion of the pulp industry toward the northern Rockies and Pacific Coast will go will depend upon the care with which the present supply of timber in the East is handled. The pulp and paper industry is closely associated with the centers of population, and its most logical and economic place is still where it is today, and it will depend on the men who own large tracts of timber whether it should remain here or gradually go West in search of new supplies.

In the second place, the adjustment will necessitate considerable change in the methods of manufacture. New woods will require modification in the present methods of cooking and grinding processes. The utilization of mill waste will require these and other changes, such as improvement in barkers. Evidences exist already of rapid change in all of these matters.

In the third place it will inevitably mean a closer coalition between the pulp and paper industry and the lumber industry. Thus far they have been quite independent, each going to the woods for its raw material, pursuing its own course of manufacture, and turning out its own product. From this time on we will undoubtedly see a uniting together of these two industries. Frequently we shall see pulp mills established in or near the lumber centers, where they may depend upon sawmill waste for a portion of their raw material. The coalition of the two industries would generally be advantageous. It would mean the lessening of the waste of valuable material and help in general to reform the old methods of the lumbermen. It would place the use of our forests upon a permanent and scientific basis, so that the growing of timber may be made a profitable business, and the production of pulp and lumber might go on permanently, probably with decreasing cost, with lighter waste, and with higher efficiency.

REMINGTON MARTIN.

(Special to Pulp & Paper Magazine.)

Watertown, N.Y., March 25, 1914.

The plans made public several weeks ago by Attorney Floyd L. Carlisle, acting, it is stated, for George C. Sherman, D. C. Middleton, G. H. P. Gould, D. M. Anderson, Robert J. Buck, Charles B. Rogers and himself, for the organization of a corporation to take over the control and management of the Remington-Martin Paper Company, the Raymondville Paper Company, the Norwood Paper Company, and the Norwood & St. Lawrence Railroad Company may not be carried out, and Arthur C. Hastings, president of the American Pulp & Paper Association and the head of the Cliff Paper Company of Niagara Falls, may not come here to take up the management of the proposed company. It is stated that a new plan for the future management of the concerns, which have since their organization by the late Charles H. Remington been known as the Remington group of newsprint mills, is being considered by the companies. It is also stated that none of the men above mentioned in connection with the proposed \$2,000,000 corporation with Mr. Hastings as the head, are interested in this plan.

The Manufacturers' Paper Company of New York, which has been the selling agent for the Remington mills for some time, is the largest creditor of the Remington companies and is said to be vitally interested in this new proposition. The exact details of the new scheme will probably be made public in a short time. At present those who are in a position to know the exact status of the case are reticent.

Report has it that the Remington interests will take care of their financial matters among themselves, and that the group of bankers and other paper mill men will not take part. It is said that the plan is to raise \$400,000, of which \$250,000 would be used as a working capital and about \$150,000 would apply on debts of the companies. Of the \$400,000 planned to be raised it is claimed that \$200,000 has already been raised in New York, and that with funds obtained in this city only about \$70,000 is lacking. F. M. Hugo, treasurer of the Remington Companies, stated that definite news would not be given out before the last of this week on this feature of the proposition.

Control and Report Systems.

Pulp and paper mills are no exception to the world-wide industrial rule that every small detail has to be looked after carefully to obtain good results.

Too many failures in the line have proved that to drive the production to the highest possible and to save labor to its utmost limit is not enough, and of only secondary importance, though essential.

The saving of materials, i. e., the elimination of waste, makes the profit.

A mill operator has usually so many more important things to look after in the running of the mill that he personally has not the time to make regular daily investigations of all minor matters.

The general manager also needs to know how things are, in order to be able to judge whether all departments are going as they should.

It is, therefore, most essential to have a man, a comptroller, to make daily investigations and tests, preferably a man with some chemical and practical training, making him fit to criticize his own work as well as to report immediately if anything is wrong.

Automatic recorders are expensive in first cost, and many of them need quite a lot of study and attention in order to get them to run properly, but they are, nevertheless, the best means of controlling:

- 1a. Steam pressure.
- 2a. Temperature of flue gases feed water and superheated steam.
- 3a. Percentage of CO_2 in flue gases.
- 4a. Pressure and temperature in digesters.
- 5a. Speed of paper and other machines.
- 6a. Percent of SO_2 lost in the acid system in sulphite mills.
- 7a. Percentage of SO_2 in the gases going to the acid system.
- 8a. Weight of products from the different mills and departments and also for many other similar purposes.

Other things will, however, take the larger part of the comptroller's time.

Material coming into the mills as well as all materials in the mills, raw or in state of manufacture, should be noted every day, also production, waste paper and similar materials.

Necessary test of chemicals ready for use in the different processes should be done, and instructions for charges given or, where the tests are entrusted to the men in charge, their tests occasionally checked and all their signing gone over.

He should also make slides of fibres and compare those with standard slides, test paper for weight and strength, determine ash in paper and pulp, where this is necessary and make other determinations which can prove necessary.

If the testing apparatuses are fitted up properly to prevent loss of time, and necessary tables are made up for the different testings one man should be able to make all these tests and investigations, even for large mills, and still have time to make extracts from his own notes, as well as from records and department reports, and to make out necessary daily and monthly reports.

In every department, and at every machine and apparatus working independently, a daily record should be kept.

In keeping the working of department or machine records at all times.

- 2a. Shut downs, and reasons therefor:
- 3a. Necessary repairs and alterations which need not be done immediately.
- 4a. Occurrence of anything unusual and not commonly observed.

Those reports should contain everything that is of importance for judging the results, but should not contain anything which is not essential. The men responsible for making out those reports will soon find out what can be marked down without investigation and without detection, and from here the step is not large to mark down important facts without investigation, or so as to guard themselves from blame for mistakes made. This latter can easily lead to misjudgment, and to further mistakes until the real reason is found, and may also lead to considerable losses.

Where there is a suspicion of fake reports, the comptroller should, from time to time keep a close check on the figures in those reports in order to make sure that he gets correct figures on which to base his reports.

All departments reports, records and the results of the comptroller's tasks and investigations, should be handed over to the respective men in charge as soon as necessary extracts are made for the general report. This should be done in order to make it possible for the man in charge to compare different reports as soon as possible, to make investigations and to find remedies where something is not as it should be.

A daily as well as a monthly report, or a two or four-weekly report, where the employees are paid weekly, should be made out, giving all necessary details for judging whether anything is not as it should be in any department.

The report should contain maximum and minimum figures from previous reports, or standard figures, for comparison; the monthly reports also figures for the same period of the year previous.

It should here be said that the help of a trained chemist, with a wide practical experience, is most essential for bringing the standard figures to their best form from a scientific as well as a possible practical point of view, especially where the man in charge of the mill has no chemical training himself.

Those standard figures should be actual results obtained in the mills, not merely figures to be aimed at.

Above mentioned reports, daily as well as monthly, would be gone over carefully and discussed between the men responsible. Suggestions should be made for every possible lowering of costs of production and repairs, saving of materials, increasing of production, and so on, and remedies suggested and decided on.

If only this scheme were generally followed throughout the pulp and paper line and live men, who thoroughly knew their business practically as well as theoretically, were put in charge of the mills and their suggestions followed!!!

Our line should then, in general, be in a much more flourishing position to-day than it is.

We have cheap wood, cheap power and a large market, and our European competitors have to pay the double to quadruple price for their wood, have often to send their products by rail for large distances to nearest shipping harbor and have also to pay the large over-sea freight.

Their lower cost in wages and supply materials is of secondary importance. It is their scientific management that makes it possible for them to take up the competition on this Continent!!

Standard Test for the Bleaching Qualities of Pulp

Sindall and Bacon.

Attention has again been directed to this important and interesting question by Messrs. Baker and Jennison of the Wall Paper Manufacturers, Greenhithe. These gentlemen are fully qualified to deal with the points which arise in connection with the bleaching of wood pulp, and the very suggestive paper read by them at the recent meeting of the Society of Chemical Industry is sure to attract notice.

The writers of the paper read at the Society's meeting gave a detailed account of the many experiments which they had carried out. These were mainly limited to the behaviour of what is known as easy bleaching pulp, which rather ambiguous term has been devised, through trade custom chiefly, by considering that any pulp which did not bleach with 12 per cent. of powder to a satisfactory color, could not be described under such a term.

Such interesting and vital points as the influence of the soluble content of the pulp itself, that is to say, the compounds present in the pulp which could be extracted with water, and the degree of concentration of the pulp, came under review. The writers have emphasized the facts which have been brought up by previous workers in this sphere, that the total consumption of bleach is materially influenced by this and similar conditions. There is no doubt that there have been some attempts from time to time in practice to wash out the soluble content of pulp by a previous extraction with water before adding the correct amount of bleach solution, but the economy of such a method is rather open to question unless it can be shown that the consumption of bleach by such aqueous extract amounts to at least 2 per cent. We are not aware that the normal pulps offered on the market would show as large a proportion as this. It would at least indicate that the pulp had not been completely washed before being made up into sheets.

The experiments of Temperley, made some years ago, indicating the folly of using back bleach residues from the potching engines for lixiviating further quantities of bleaching powder, were amply confirmed by these investigators, and the more precise details given, when published in the *Journal of the Society of Chemical Industry*, will afford useful information in this direction.

The interesting point of the degree of concentration of the pulp was discussed, and an account given of certain experiments in which the proportion of solution mixed with the pulp was varied, and it was shown that the thicker the consistency of the pulp mixture, the greater was the efficiency and economy obtained. This is mainly due to the fact that in using a very concentrated mass it was possible to have the bleach solution of higher density. It seems correct to assume that by having a liquor of higher specific gravity, in this way, the activity of the chlorine was increased. Or it would be more correct to say that the extra dilution of bleach liquor, which is obtained under ordinary practice, reduces the activity of the hypochlorite.

The most valuable suggestion of the authors of this paper was found, as is usual with documents of this character, towards the end of it. The experiments of Sindall with the use of the tintometer for the measure-

ment of the degrees of whiteness of bleach pulp were referred to, and the authors appear to have devised a method by which the absolute color could be shown to perspective buyers. It was rightly argued that the measurements by the tintometer, though giving precise and absolute figure values, did not in themselves afford the buyer any idea of the whiteness of the paper, owing to his ignorance of the figure values. It was proposed to prepare a series of porcelain plates having certain definite color values corresponding to certain degrees of whiteness of the pulp. In this way it was hoped that the pulp agent would be enabled to present in tangible form to the buyer a sample of the pulp which was offered for sale, and also a porcelain plate representing the color which might be expected on treating the sample of pulp with certain definite amounts of bleach.

There can be little doubt that this would be rather convenient as the pulp agent could carry with him samples of porcelain plates corresponding to certain grades of white, and since the grades of white could be permanently recorded by and always corrected by the tintometer, there would be no difficulty in duplicating plates as required, and ascertaining their color values in terms of tintometer readings.

Among the analysts present at the meeting there was a consensus of opinion as to the value of the tintometer for measuring grades of white. One or two speakers referred to the accuracy of the readings obtained on the tintometer for the measurement of flour. Mr. Sindall mentioned that in his own experiments he had submitted to Mr. Lovibond, the inventor of the tintometer, a series of bleached pulps, the colors of which had been obtained by submitting a known sample of pulp to varying quantities of bleaching powder. In this way a complete set of samples showing the effect of 4, 8, 12, 16, 20 and 24 per cent. of bleach had been used. The samples were numbered in a promiscuous order and the readings tabulated, showing the gradual elimination of the red and yellow coloring matter, which corresponded in practically every case with the correct order of the samples as bleached.

The chief value, however, of the paper submitted was the suggestion of permanent white colors in the form of plates, and since the color of such plates could easily be checked by the tintometer, it is clear they would have a technical usefulness for the purpose already described. The comparison of the rough paper texture with the smooth surface of a porcelain plate does not offer any serious difficulty according to the experience of Messrs. Baker and Jennison.

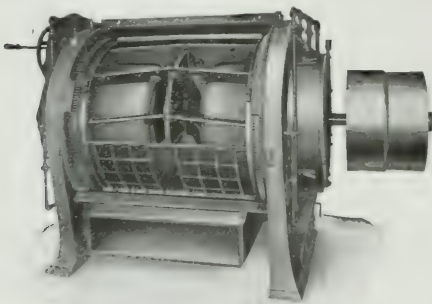
TESTING DEGREE OF BEATING PAPER PULP.

E. W. L. Stark, in a recent contribution to *Der Papier Fabrikant*, on the subject of an apparatus for the testing of the degree of beating of paper pulp, says a measured quantity of pulp from the beating engine—50 cc.—is diluted with water to 500 c.c. and poured into a tap funnel fitted with a wire cloth sieve. The tap is then opened and the volume of water collected at equal intervals of time—1, 5 or up to 30 seconds—is noted. Curves plotted with volumes of water as ordinates and time intervals as abscissae then illustrate the degree of fineness of the pulp and its rate of draining on the paper machine wire. Provided the concentration of the pulp is constant, these curves are comparable with each other and afford an indication of the state of preparation of the stuff. When the concentration of the pulp is variable, the curves may be corrected to a standard concentration after a determination of the dry substance has been made.

Centrifugal Screens

If one has been in touch with progressive pulp and paper mills, he has noticed that their screenings systems have undergone the most radical changes within recent years. The screen rooms of many mills were, and not a few still are, places where the economy engineer has many suggestions to offer. In many mills a few years ago large rooms were crowded with Flat Screens which kept a crew of repair men busy almost continuously. Today, when one enters some of these mills the noise of the screen room has vanished, where formerly the room was crowded with Flat Screens and where no place was left for other machinery, one can see to-day a row of Centrifugal Screens occupying only a small part of the room, but doing as much work as the former Flat Screens did. There is now enough room left for Wet Machines, Deckers, Conveyors, Pumps, etc.

There always was naturally a feeling against Centrifugal Screens. The Flat Screen is old and had been fully developed. The Centrifugal Screen was just coming into use. The designers had to learn. The best sign for its right to existence was the fact that numberless firms took up its manufacture. Their engineers



and advisers saw that the future was coming to the exclusive use of the Centrifugal Screen. Despite the disadvantages of the many kinds on the market, they saw that the Flat Screens could never offer the economical features which the former have, and they knew that the Centrifugal Screen needed development.

In quite a few mills to-day we observe a new kind of Centrifugal Screen in appearance, quite different from the earlier makes. It looks very practical, and it works out as practical. The feed spout, outlet spout and drive are located where the practical mill man likes to have them. The engineers that recommend the installation of this Screen say it is the most convenient to set up, the mechanical advantages are remarkable, and the practical pulp and paper maker likes it better than other machines. This machine does not ignore the good features of the earlier types, all of which were some good points, but it embodies a combination of their advantages, the outcome of close observation of the various types and it eliminates the drawbacks which have been noted by experienced mill men who have used all kinds of types.

Everyone familiar with Centrifugal Screens knows these disadvantages. Screen will deposit the drawback on a small turn left, or a belt pulley on a vertical shaft, or the loss of power through steps or thrust bearings on pulleys, and the possible trouble result-

ing from the use of such apparently necessary means, or the bad influence which change in the stock supply has on many of the Centrifugal types of Screen, or the loss of time and money if the inlets or outlets plug up. Disadvantages such as these had to be overcome in the development of the Centrifugal Screen. Engineers and papermakers tell us that in the Improved Screen these drawbacks are eliminated, and that they believe it represents the Centrifugal Screen to which the future belongs. Standing in front of the machine one wonders at the nice and steady running without any noticeable vibration. It does not begin to shake if the stock comes thicker or in a rush.

The pulley is on a horizontal shaft and a plain straight belt drive can be employed. The runners are so arranged that the end thrust on the shaft that is common to other horizontal types is eliminated. There is no packing around the shaft or anywhere on the Screen. Inlet and outlets are arranged in a most practical way. The two ends of the machine are entirely free from spouts, and thus the machine and the bearings are easily accessible. It is quite a relief to the mill men to know that the Improved Screen is not going to give trouble if the stock comes too thick or all in a rush. The good stock will not then all be thrown out through the tailing spouts, and no step bearing is going to run hot.

The degree of screening can be adjusted through throttling of the shower pressure. It is possible to reject tailings more or less as desired. This makes this Screen especially valuable in front of newspaper machines or board machines. The plates may be revolved by means of a handwheel or a clutch if the machine is running. By lifting the top cover and revolving the screen drum, the plates may be easily inspected in one minute.

The Improved Screen does not embody one man's idea, but is designed through the assistance of first class practical men, who have had years of experience with all kinds of Centrifugal Screens.

It may be successfully used for ground wood, sulphite, sulphate straw boards and all kinds of binder boards, news and wrapping. The centrifugal screen made by the Sherbrooke Machinery Co., has all these advantages and is one of the best on the market.

NEW BOARD MILL FOR MONTREAL.

The Montreal Boxboard Co. has been organized by Mr. O. A. Porritt, formerly General Manager of Price Bros. & Co., Ltd. Associated with him is Mr. J. R. Walker, the waste paper deal of Montreal, who is also interested in the National Paper Co., Valleyfield, Que., and the mill at Sault au Recollet. They are rebuilding the old buildings of the Montreal Woolen Co., on the Lachine Canal in Montreal.

Mr. Porritt will place the order for the board machine in a couple of weeks. It will be a six-cylinder machine and will have approximately fifty dryers.

They will manufacture chip board from the waste papers of Montreal, the supply of which Mr. Walker controls. It is their purpose also to make all kinds of pulp board, and patent coated board. Mr. Porritt's wide experience at Jonquiere Pulp Co. mill will ensure the success of his newest venture. The market in Montreal is sufficient to handle the entire output, which will be delivered by motor trucks. These same trucks will be used to gather the waste papers. Being on the Lachine Canal, the coal supply will also be obtained cheaply by water, and pulp can be delivered at the mill side by water.

UNITED STATES NOTES

(Special to Pulp & Paper Magazine.)

Business at the Anchor Mills Paper Company at Windsor Locks, Conn., is not very brisk at present, and preparations are under way for the shutting down of the plant. The owners are not particularly anxious to continue the business much longer, and have offered the mill for sale. They have received some offers for it, but not as much as they deemed it worth, so the bids were not accepted. It is planned now to work up such stock as is on hand and then shut down. Some of the employees have already obtained other employment in view of the uncertain nature of the mill. The plant is one of the oldest landmarks of the town, having been established first as a paper mill when the town itself was founded in 1851.

The Case Board Company of Andover, Mass., which has not been running for several weeks on account of a broken cylinder on the engine, has completed the repairs, and is now operating full again.

The White-Corbin Division of the United States Envelope Co., at Rockville, Conn., plans to erect an addition to its plant in West Main Street. The new structure will be 130 feet by 90 feet and will be located west of the present building. This division is one of the largest envelope plants in the country. Nearly three million envelopes a day are turned out. The company employs about 165 hands.

Waste paper is no longer wasted at the city hall at Detroit, Mich. Mayor Prince has purchased a paper-baling machine, and has installed it in the basement of the city hall. All the paper from the city hall, the police station and the municipal court is now brought to the basement of the city hall, instead of being thrown into the furnace or trucked to the dump. This paper is purchased by a local concern at 27 cents per hundred. The same company last week bought a big quantity of old books and records from the city for 25 cents per cwt.

The annual meeting of the stock holders of the United States envelope company was held in Portland, Me., last week. Waldo E. Buck, president and treasurer of the Manufacturers' Mutual Insurance Company, was chosen a director in place of Rred. H. Daniels, who died August 31, 1913. W. O. Day of Springfield, Mass., was chosen treasurer and Franklin C. Payson of Portland, clerk. All the other directors were reelected. It was voted to amend the by laws to read that the transfer books shall be closed for 14 days prior to any stockholders' meeting, instead of 10 days prior to the payment of any dividend.

Charles Clugston, superintendent of the Baid division of the American Writing Company at East Lee, Mass., has resigned. Mr. Clugston has been in charge of the mill for six years. He went to Lee from Holyoke, and is a papermaker of much skill. It is not known definitely what his future plans are, but it is thought he will return to a position in Holyoke. Mr. Clugston is to be succeeded by George W. Bradburn, who is super-

intendent of the company's mill at South Lee and who will have the oversight of both mills.

A building boom is imminent in the hustling paper making town of Rumford, Me., and it is expected that contractors will be busy before long in several undertakings. There have been rumors of an addition to the Oxford paper mill, and also to the new coated paper mill, but these rumors have not been substantiated as yet, although the addition to the Oxford mill is said to be a certainty at some near future date.

The Composite Board Company of Niagara Falls, which went into the hands of a receiver several months ago, is expected to be reopened again under a firm financial basis in a few weeks. Edward Hill was president, and A. J. Kay secretary of the old company, and it is expected they will be retained at the head of the reorganized company. The receivers' foreclosure sale resulted in the purchase of the plant, equipment and stock by the Niagara Falls Power Company. Particular satisfaction is felt in paper making circles over the success of the company in reorganizing.

The Raquette River Paper Company, of Potsdam, N. Y., of which Geo. W. Sisson, Jr., is the president, is making new arrangements for the sale of its product, and has sent the following letter to its patrons:—Gentlemen:—With a view to keeping in closer touch with your needs and to give you better service, we have arranged to have Mr. Edwin P. Lindsay, of Boston, handle the sale of our papers. This arrangement will enable us to devote closer attention to the manufacturing end and result in even greater uniformity and excellence of our product. Our mutual relations will be as direct and intimate as ever, and we shall visit our friends as opportunity offers. We confidently expect and bespeak for Mr. Lindsay and his selling organization, the same kind consideration that you have shown us in the past. Yours very truly, The Raquette River Paper Company, (signed) Geo. W. Sisson, Jr., president.

On application of the directors of the corporation, Justice Andrews has granted an injunction restraining the prosecution of suits against the Battle Island Pulp & Paper Company of Flton, N.Y., granting the voluntary dissolution of the company, and naming F. B. Shepherd of Oswego as receiver. According to the petition there are \$448,000 in notes against the company, the interest on the bonds has not been paid, and there is no cash on hand. The plant of the Battle Island Paper Company has not been running for over two weeks, and cannot be opened until an order of the court is obtained. If this is done, authority will have to be given the receiver to borrow money to carry on the business. Mr. Shepherd was placed under a \$500,000 bond and at present will simply take charge of the receipts and disbursements. Unless it can be shown that the plant can be operated at a profit it will probably eventually be sold by the receiver.

The International Paper Co. is making an effort to make a grade of paper at Ticonderoga, N.Y., for Sears, Roebuck & Co., that that concern has had difficulty in obtaining, and it is believed that success will crown their efforts. A number of mills have tried to make this paper, which is very light, weighing but twenty-two pounds to the ream, but have been unable to make stock entirely satisfactory to the big Chicago house. The Ticonderoga mill started making the paper two weeks ago and, while the right color has been obtained, the stock is not as yet to the required weight. It is believed, however, that this will soon be overcome. The mail order house will use ten thousand tons of the paper a year and, with another like this in prospect, it is certain that Supt. Mulroy, one of the paper company's expert and most experienced men, will make every effort to turn out stock that will meet the requirements.

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A delegation of Papermakers headed by W. R. Smith, vice-president of the International Brotherhood of Paper Makers, recently paid a visit to the general offices of the American Writing Paper Company at Holyoke, Mass., for a conference with General Manager Alfred H. Leeds, relative to the establishment of the three tour system in all mills of the combine. The company adopted the three-four plan about two years ago, and all the mills of the combine, with the exception of the Massasolt, Holyoke, Linden, Parsons and two Riverside divisions have adopted the plan. The object of the conference is to find out whether or not the American Writing Paper plans to change over these mills, and when. Committees from each of the six mills are included in the delegation.

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Edward L. Rantoul, formerly of Salem, Mass., is among those prominent in the development of a million-dollar pulp company. A Massachusetts Charter was issued last week at the State House to the Androscoggin Pulp Company, capitalized for \$1,000,000. Associated with Mr. Rantoul in the Corporation are James M. Wheaton and Richard S. Russell.

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The Columbian Paper Company, of Jackson, Miss., began the manufacture of pulp from pine wood last week. This is the first time the plant has ever undertaken to manufacture pulp from pine wood, although a little pine has at times in the past been mixed with other woods used in manufacturing the pulp. There is a considerable amount of pine on the yards of the plant at Jackson, which will be used in experimenting with the manufacture of pulp from that wood.

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The New York Paper Company of Baltimore, Md., was sold March 16 to William Bauernschmidt. It is understood that the business and property was purchased for \$18,000 cash. There was a mortgage on the building of \$7,000, which was also assumed. The worth of the business is about \$12,000 and the total inventory was supposed to be \$3,000. This concern was purchased from the Whitehall Paper Company. The New York Paper Company dates back to 1898, it having been owned first by Frederick Brundeman and company until April 1911, when he formed a corporation known as the Whitehall Paper Company. This corporation owns a mill at Whitehall, Md., and operates the mill in connection with the old business of the New York Paper Company.

New Woods for Paper

(Special to Pulp & Paper Magazine.)

New York, March 25, 1914.

As announced last month in the Pulp & Paper Magazine the New York Herald printed an issue on paper made at the Government's experimenting plant in Wisconsin from wood other than spruce. It was desired to show that the life of the newsprint industry does not hinge on spruce alone. The severe practical test made by the Herald has been successful, as evidenced by the results and the evidence of the printers. Seventeen formulas have been tried out at the Forests' Products Laboratory at Madison, Wis., and samples of sheets from each of these seem to bear out the contention in favor of woods other than spruce. The formulas as given, are:—

		Furnish
		Lbs.
Sheet No. 1.	Spruce groundwood	750
	Hemlock sulphite	250
Sheet No. 2.	Western hemlock groundwood	750
	Hemlock sulphite	250
Sheet No. 3.	Sitka spruce groundwood	750
	Hemlock sulphite	250
Sheet No. 4.	Lodgepole pine groundwood	750
	Hemlock sulphite	250
Sheet No. 5.	Western yellow pine groundwood	750
	Hemlock sulphite	250
Sheet No. 6.	Balsam fir groundwood	750
	Hemlock sulphite	250
Sheet No. 7.	Cal. lodgepole pine groundwood	750
	Hemlock sulphite	250
Sheet No. 8.	Red fir groundwood	750
	Hemlock sulphite	250
Sheet No. 9.	White spruce groundwood	375
	Hemlock groundwood	375
	Hemlock sulphite	250
Sheet No. 10.	White spruce groundwood	375
	Balsam fir groundwood	375
	Hemlock sulphite	250
Sheet No. 11.	Tamarack groundwood	750
	Hemlock sulphite	250
Sheet No. 12.	Tamarack groundwood	375
	White spruce groundwood	375
	Hemlock sulphite	250
Sheet No. 13.	Noble fir	750
	Hemlock sulphite	250
Sheet No. 14.	Alpine fir	750
	Hemlock sulphite	250
Sheet No. 15.	White fir	750
	Hemlock sulphite	250
Sheet No. 16.	Engelmann spruce	750
	Hemlock sulphite	250
Sheet No. 17.	Amabilis fir	750
	Hemlock sulphite	250

New Superintendent of Forest Products Laboratories.

Mr. John S. Bates has been appointed Superintendent of the Forest Products Laboratories, to take the place of A. G. McIntyre, who has resigned to go to Bathurst, New Brunswick.

The choice of the Government is a most happy one, for it would be difficult to obtain a better combination of personality, training and experience, adapted to that work.

Mr. Bates was born at Woodstock, Ont., and is a graduate of Acadia University in arts and science. After leaving Acadia he went to Columbia University, New York, and graduated in chemical engineering, specializing in pulp and paper. He will be granted



J. S. Bates

the degree of Doctor of Philosophy in June for work done on the chemical utilization of Southern pine waste at Columbia. Mr. Bates held the J. Pierpont Morgan scholarship in applied science, and was an assistant in quantitative analysis and industrial chemistry. In 1912 he was appointed Anthony Goldschmidt Fellow in Chemistry.

Added to all this training is the practical experience with the Union Bag and Paper Co. and Arthur D. Little, Inc., of Boston, Mass., from where he comes to Montreal.

We predict for Mr. Bates large success in his new work in this new institution, which means so much to Canadian papermakers. We also welcome him back to his native country, and feel fortunate that the possibilities of our young country are able to attract and hold men of such qualifications.

Ottawa Notes.

(Special to Pulp & Paper Magazine.)

Ottawa, March 30.—Among recent incorporations of Montreal pulp and paper firms at Ottawa are those of the Standard Pulp and Lumber Company, Ltd., incorporated with \$1,000,000 capital and among whose incorporators are Messrs. Charles Beauchemin, Joseph A. Richardson and P. Lavigne, all lumber merchants of Montreal, and the Montreal Box Board Company, Ltd., with \$500,000 capital.

Of considerable interest to the trade is the announcement that a new method of cleaning paper currency has been adopted by the Canadian Finance Department after long experimentation. The fact that bank notes carry germs has long been recognized and for some time the Department had been trying various methods of disinfecting these notes without injuring the paper of which they are made. It was found that about 20,000 living bacteria infected the ordinary Dominion note after it had been in circulation for some time the notes containing a fatty extract which tended to retain for an indefinite period any infection.

The first tests were made with formaldehyde gas and it was found that this was effective as far as the germs were concerned, but that the gas left poisonous effects. Heat was then tried, the notes being subjected to a uniform temperature of 80 degrees centigrad for four hours and this was found completely successful, the germs being killed and the paper remaining uninjured, even after an exposure of five days.

The question of the discharge of paper mill effluents into navigable waters which, as already mentioned in this correspondence, has been occupying the attention of Parliament this session in connection with the general question of pollution, has been referred to a committee which will hear evidence in this regard during the remainder of the session. Two bills, which have been introduced in regard to pollution, one by Mr. George H. Brabury, M. P., and the other by Senator Beaubien, both of which are somewhat drastic measures, were referred to the committee. During the discussion on the motion to deal with them thus, Sir Wilfrid Laurier, leader of the Opposition, urged that Parliament take action at once, and mentioned the fact that the House had years ago had considerable trouble with the lumber and paper mills on the Ottawa River with regard to the same question and had eventually gained its contention as a reason why it should brook no delay now. The Government, however, considered it wise not to be too summary.

While tales of valuable finds of diamonds and other valuables among the rubbish in paper mills are not uncommon it is seldom that such good fortune descends upon a worker therein as has fallen to the lot of Jeremiah Larocque, of Hull, an employee in the paper mills of the E. B. Eddy Company. Larocque has been notified that an uncle in California, recently deceased, has left him \$1,500,000 and has gone to claim the sum.

Fraser and Company, the large lumber firm which has announced its intention of transferring its plant from its present site at Aylmer, Que., a few miles from here, will go to Grand Lake Victoria, Quebec, it is learned. A milling company is being organized to take over the mill while its limits on the Ottawa, Black and Coughline rivers will be sold, including 500 square miles of timber and pulp wood altogether.

The Colonial Lumber Company of Pembroke has purchased from the J. D. Fraser estate, Ottawa, 200 square

miles of pine and pulp wood with a twenty-mile frontage on the Ottawa River, near the Des Moines. The limit is so conveniently situated that the timber can be brought down to the company's mills in a day.

Inside a week the Finance Minister, Hon. W. T. White, will bring down the Budget in Parliament, and this will clear the decks for a tariff discussion. That there will be no change in the schedules as affects lumber, pulp or paper, may now be stated as a practical certainty, although Western deputations have asked for the former.

CANADIAN FOREST PROTECTIVE ASSOCIATION.

(Special to Pulp & Paper Magazine.)

Ottawa, Ont., March 25.—Following the example of Quebec lumbermen and paper manufacturers, members of both trades in Ottawa district have taken steps towards the establishment of what will be known as the Canadian Forest Protective Association, a body which will be largely along the lines of that organized some years ago in the St. Maurice Valley for the protection of limits there.

Two meetings have already been held and at the last one, held last week, a committee was appointed to undertake the work of organization. It consists of Senator W. C. Edwards, of the W. C. Edwards Lumber Company, of Ottawa; Mr. J. B. White, of the Riordon Pulp and Paper Company; Mr. R. M. Kenny, of the James MacLaren Company, of Buckingham; Mr. Geo. H. Millen, of the E. B. Eddy Company, and Mr. Ward C. Hughson, of Gilmour and Hughson, of Ottawa.

It was decided that the plan of organization will include the appointment of a manager, under whom will be four inspectors and that these in turn will direct a staff of rangers. On all commanding positions lookouts will be established to give warning in case of fire and telephones will be installed throughout the different limits whose owners are members of the association. The railroad lines throughout the limits will also be patrolled and by all these means it is hoped to very greatly reduce the loss from forest fire, now so great.

Among the firms which were represented at the last meeting were: The Riordon Pulp and Paper Company, represented by J. B. White, Charles Read and John Gwynne; Messrs. George H. Mille and J. F. Rochester, of the E. B. Eddy Company; Senator Edwards, Gordon C. Edwards and J. A. Cameron, of the W. C. Edwards Company; P. C. Walker, of Shepard and Morse; Sir H. K. Egan, of the Hawkesbury Lumber Company; J. C. Brown, of Fraser and Company; J. H. Black, of J. R. Brock and Company; E. J. Graham, R. M. Kenny and J. E. Rothery, of James MacLaren Company.

NO SULPHITE SPIRIT IN NORWAY.

According to the Tidsskrift for Papirindustri, the fact that Norway differs from Sweden in doing nothing to allow the waste (yes from its important sulphate pulp factories) due to the fact that they have no capital for the erection of the necessary plant. During the last two years, according to Stock Exchange reports, of the Norwegian sulphate pulp factories which do not use the so-called aluminous for paper-making, only three have been dividend. The cost of plant for making aluminous from the waste has not been considerable, and the others would be no more.

UNION BAG.

Canada plays a more or less important part in the policies of the new management of the Union Bag and Paper Co. of New York. The policy of the present management is first to attempt to restore the injured credit of the company, and the initial step towards this is to pay its debts. Following this, unproductive properties must be made productive or sold, and certain of the manufacturing plants must be modernized. These details are set forth in the annual report just out.

Union Bag reports net earnings of \$534,535 and a balance, after interest, sinking funds and depreciation, of \$50,982. This result compares with a deficit of \$287,007 in 1912, after paying the preferred dividend. The company in 1913 earned .45 per cent on the \$11,000,000 preferred against .39 per cent on the same stock in the previous year.

The company's principal financial difficulties in the past have been due to dissipation of its financial resources in the purchase of an obsolete mill at Hudson Falls, N.Y., at a cost of \$1,000,000, and the construction of a wood-pulp mill at Cape Magdalene, Quebec, at a cost of over \$500,000. This mill is practically useless for lack of power with which to operate it, and the absence of a newsprint mill to consume its product.

At the close of the fiscal year, January 31, 1913, the company's unsecured bank indebtedness in Canada was \$382,500. It was, at the close of the fiscal year, January 31, 1914, \$340,000. Liquid assets in Canada are as follows: Inventories \$1,066,363, accounts receivable \$67,642, making a total of \$1,134,000. The directors state that by arrangement with the company's Canadian bankers they are content to have these loans liquidated by a gradual conversion of inventory.

Mr. John S. Reigel, the president, states that the company "must also strengthen itself to meet conditions arising out of the prohibition of pulpwood export from Canada and the recent tariff action of the U.S. government."

BAMBOO PAPER IN BRAZIL.

A small paper mill, belonging to the Companhia Fabrica de Papel and Papellao, at Porto Alegre, Rio Grande do Sul, Brazil, makes about 400 tons of wrapping annually. About two-thirds of this is made from bamboo, the rest from wood pulp, but the two are used separately.

As they find it cheaper to make paper from bamboo than from wood pulp, they contemplate disusing the latter altogether. With this end in view, they have made bamboo plantations close to the mill, which in two or three years' time will obviate the necessity of using any wood pulp at all. On the initiative of the German potash syndicate, a part of these plantations has been manured with potash salts, with the result that that part grows faster than the rest, and produces stronger plants.

Of course, bamboo paper is neither so strong nor so good-looking as ordinary wood pulp paper, but it is quite good enough for many purposes. As it can be sold cheaper, on account of the tariffs, than imported wrapping papers, it finds a ready sale in the country of its origin.

ASSOCIATION OF JAPANESE PAPER MILLS

Nippon Seishi Rengokai.

Brief Sketch of the Organization.

The history of the Nippon Seishi Rengokai dates from 1880, in which year it was first organized by the Oji Paper Manufacturing Co., the Yukosha Paper Co., the Kobe Paper Mill, the Mita Paper Mill and the Osaka Paper Mill, the principal object of the organizers being to fix from time to time the selling prices of their products by agreement. The system, however, did not work satisfactorily, and the impracticability of the original plan was realized after trying it a year or two. The Association was therefore converted gradually into an organ for social intercourse. The by-law has since been amended two or three times. The Association, which considers matters of general interest to the paper industry of Japan, is at present an important organ for promoting the welfare of its members. Statistics of production, imports and exports are published in the Association's official Magazine, which contains among other things, articles on various subjects relating to paper. Practically all the manufacturers of European paper in Japan are members, whose names are as follows:—

Oji Paper Manufacturing Co., Ltd., Tokyo.
Fuji Paper Co., Ltd., Tokyo.
Mitsubishi Paper Mills Co., Ltd., Osaka.
Kiushi Paper Co., Ltd., Matsukuma, Kumamoto.
Yokkaichi Paper Co., Ltd., Yokkaichi, Miye.
Chuwo Paper Co., Ltd., Nakatsu, Gifu.
Kokura Paper Co., Ltd., Kokura, Fukuoka.
Tokyo Itagami Co., Ltd., Tokyo.
Umez Paper Co., Ltd., Kyoto.
Noda Paper Mills, Osaka.
Nakanoshima Paper Co., Ltd., Osaka.
Yukosha Paper Co., Ltd., Tokyo.
Kiso Kogyo Co., Ltd., Kiso, Nagano.

The total capital invested by these 13 members in their enterprises amounts to about 30,000,000 yen, and the number of mills owned by them is 20. In addition to 54 machines actually running, there are three or four new ones in the course of construction. Besides the Government Paper Mill, which is not a member of the Association, there are some manufacturers who remain unaffiliated. They are, namely, the Toyo Paper Co., Ltd., of Osaka, which manufactures cigarette paper exclusively, the Teikoku Paper Co., Ltd., whose mill is

now in the course of construction in Osaka, and eight concerns manufacturing straw-boards.

Production of Paper in 1913.

The total production of European paper (except straw board) in 1913 by the thirteen principal concerns constituting the Association of Japanese Paper Mills may be compared below with the figures for the two preceding years.

	Lbs.
1913	295,892,821
1912	251,377,312
1911	243,204,346

The increase of production in 1913 over that in 1912 amounting to about 18 per cent is due chiefly (1) to the marked increase of output at the Tomakomai Mill of the Oji Paper Manufacturing Co., where some equipments were improved, and (2) to the admission to membership of the Kiso Kogyo Co., whose mill commenced operation in January, 1913.

The production in 1913 may be classified below according to the grades of paper manufactured:—

	Lbs.
Printings	96,332,282
News Printings	125,953,117
Simili	8,148,159
Imitation Japanese	10,112,556
Match	9,328,833
Coloured	4,703,959
Wrappings & Packings	17,679,198
Imitation Chinese	7,857,204
Miscellaneous	15,782,613
Total	295,892,821

Owing to the changed classification adopted in January, 1913, the statistics given above can not be compared with those for the preceding years.

Imports of Paper in 1913.

Various grades of paper imported into Japan during the year 1913 may be compared below with the statistics for 1912.

N.B.—In the following statistics, which have been copied from a Government report, the unit of weight is "Kin" equivalent to about 1 1/3 lbs.

1913.		1912.	
Quantities.	Values.	Quantities.	Values.
Kin.	Yen.	Kin.	Yen.
Printings, weighing not more than 58 grammes per square Metre	9,496,645	8,496,644	6,442,323
Other printings	23,293,764	2,704,610	20,870,090
Writings	2,573,298	443,508	2,250,308
Drawings	649,299	147,279	1,338,098
Packings and Wrappings	7,579,422	690,442	5,079,824
Match Paper	1,247,888	119,987	1,811,855
Cigarette Paper	2,656	892	6,184
Pasteboard or Cardboard	4,819,232	392,969	4,075,879
Chinese Paper	333,537	67,426	237,187
Imitation Japanese and Tissue	7,541,012	798,574	12,597,254
Imitation Parchment, Paraffin, and Wax Papers	1,369,897	209,892	1,175,002
Other Papers	2,898,671	830,231	2,991,557
Total	62,505,271	7,237,474	59,476,061
			7,113,943

The total value of paper imported in 1913 shows an increase of 123,531 Yen over the figures for 1912. Of the items showing increase or decrease, the principal ones may be mentioned. The growing demand for printings of higher grades is reflected in the statistics of printings weighing less than 59 grammes per square metre and of those coming under "Other Printings"; the increase amounts to some 243,000 Yen and 344,000 Yen respectively. Attention may be called to the imports of packings and wrappings, which show an increase of 236,000 Yen over the figures for 1912. Compared with the figures for 1911, the increase amounts to 410,000 Yen. This singular tendency may be accounted for by the fact that the manufacture of packings and wrappings in home mills does not increase in proportion to the growing popularity of these lines all over the country for wrapping up things. The decrease of 48,000 Yen shown under match paper is due to the increased production by the Japanese manufacturers. A reference may be made to the Toyo Paper Co., which is not a member of the Association of Japanese Paper Mills. That company supplies nearly the whole of its output to the Government Monopoly Bureau, and the imports of cigarette paper have decreased to such an extent that it hardly deserves an independent item in the statistics. Attention may also be called to the decrease of some 500,000 Yen shown under imitation Japanese and tissue paper, which is due to the marked increase of home production stimulated by the revised tariff.

Pulp Trade in 1913.

The statistics of pulp imported into Japan during the past three years are as follows:—

	Quantities. Kin.	Values. Yen.
1913	78,761,780	4,630,477
1912	76,904,983	4,379,861
1911	53,688,559	2,756,518

In the customs returns published by the Government, pulp is divided into two classes, viz.: "Mechanical Pulp" and "Others." It may, however, be pointed out that mechanical pulp imported during 1913 is about 2,000,000 Kin, the value of which does not exceed 100,000 Yen. Under "Others," the quantity of soda pulp is so insignificant that sulphite, both bleached and unbleached, constitutes by far the largest part. The remarkable increase of sulphite pulp is an evidence of the recent expansion of the paper industry in Japan. The present tendency of the pulp trade will remain unchecked until a pulp mill or two now being erected in Karafuto (Japanese Saghalien) can put their products on the market.

Paper Trade in 1913.

After the close of the war with Russia (1904-5), the principal paper companies in Japan either extended their works or erected new ones by increasing the capital. Upon completion of these works, some grades of paper turned out by different mills began to flood the market. At the same time, the manufacturers had to face keen competition with foreign goods, which resulted in a dull trade covering a period of several years. It was in 1912 that the market began to show signs of improvement, owing to the active demand for the production of some mills. The year 1913 opened with greater activity; various mills brought up-to-date were opening in and being. It was, however, realized that this prosperity was getting moderate for the growing demand. It is quite natural that, under these circum-

stances, several companies should have decided to extend their plants, some of which have already been completed. A sudden set-back was experienced in the summer of 1913, and considerable dullness of trade prevailed in the autumn, which is usually a season of brisk business. Towards the close of the year, all the mills were more or less overstocked in all lines except news printings. It is, however, the importers of paper that sustained the severest blow. In spite of dullness that prevailed during 1913 in the paper trade of Japan, the profits of the paper manufacturing companies for the second half of that year compare favorably with those for the first half. It is a general belief that the Exhibition to be held in Tokyo in the Spring of 1914 and the Coronation that is to take place in Kyoto in the fall will stimulate the demand for various lines of paper and improve the market.

THE DETERMINATION OF THE KIND OF LOADING MATERIAL IN PAPER.

The kind of loading material in paper is determined at the present day, generally speaking, by chemical analysis of the ash, and partly by microscopically observing the shape and size of the particles of ash. The former method is troublesome and the latter unreliable. Other investigators have already noticed that loading materials are colored in various ways with aniline dyes. Formerly the coloration took place either under the microscope or in the beater. The method proposed here consists in moistening the pure white, glowd ash of the paper, as obtained when determining the quantity of loading material, with a mixture of a basic and an acid colored solution, allowing the solution to act for some time, and then sucking away the excess liquid laterally with a piece of blotting paper. The ash to be investigated is preferably put on to an object glass, a drop of the colored mixture is allowed to fall on it, both are mixed with a needle, and the mixture spread out on the object glass. The loading material precipitates the dye most nearly related to it out of the solution and the supernatant liquid is sucked away laterally with a piece of blotting paper. If methylene blue has been used as basic dye and azo acid red as acid dye, for example, the ash is coloured distinctly blue after the excess liquid has been drawn off and the ash has been dried if kaolin, tale or asbestine are present, and distinctly red if barium sulphate or plaster of Paris have been used. Two groups are thus obtained which are separated further as follows. If the dry spot on the object glass is blue, place a drop of cobalt nitrate solution on a small piece of the paper under investigation and hold the same in a Bunsen burner flame until the paper is completely white; if a blue spot (Thénard's blue) is formed kaolin may be assumed. Asbestine and tale are distinguished under the microscope owing to the former showing long slate-like or flakey fragments of fibrous stratum.

If the ash become colored red, in the event of plaster of Paris being present this can be readily recognised by the characteristic crystals of gypsum which form particularly at the edge of the spot. Blau fixe dissolves when heated in sulphuric acid, and on cooling beautiful crystals separate out. Carbonates can be best determined by adding acids under the microscope and observing the escape of carbonic acid and the shape of the crystals which form. Papier Fabrikant.

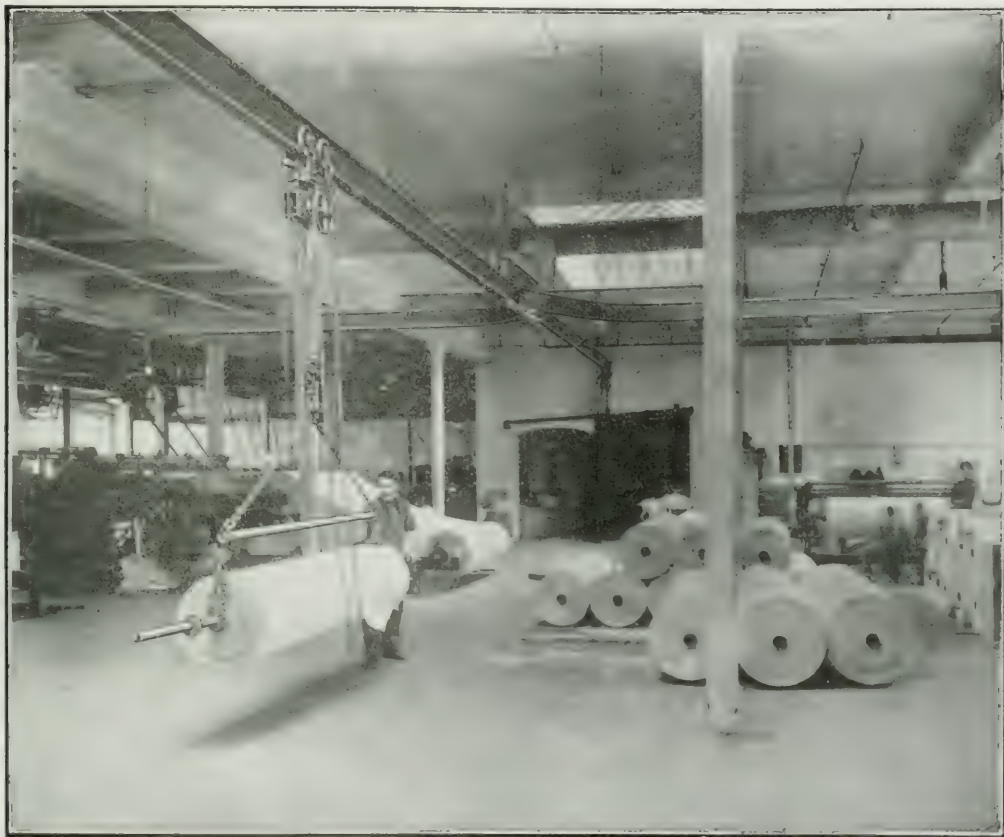
HANDLING ECONOMY.

The accompanying illustration is reproduced from a photograph taken in the new mill of the Rolland Paper Co., Limited, at Ste. Adele, Que.

Every papermaker knows how cumbersome and unwieldy to handle is a roll of paper, and how much

thousand pounds unaided, and he has it under such perfect control that he can pick up the roll, move it away at a brisk walk and deposit it on the top of the pile without calling anyone to help him.

The Rolland Paper Company is to be congratulated on its farsightedness in putting in the Morris Overhead



Rolland Paper Co.

“broke” inevitably accumulates every time a roll of paper is removed from a machine or transported from point to point in the mill.

The man in the picture is carrying a load of three

Runway which has made this economy possible. We understand that the runway which is an installation of considerable size has already paid for itself in the saving of waste, time and labor.

FORESTRY CONVENTION FOR HALIFAX.

It has been decided that the 1914 Forestry Convention is to be held in the fine old city of Halifax, and the date definitely decided upon is Wednesday, Thursday and Friday, September 2, 3 and 4.

The friends of the forest in Nova Scotia have been urging the claims of Halifax for six or seven years, and members of the Canadian Forestry Association in other provinces have backed up the effort, but until now the claims of Central and Western Canada proved too strong.

This time, however, the Government of the province and the lumbermen united in a strong invitation, and,

at the annual meeting, this invitation was accepted, and Mr. F. C. Whitman, Annapolis Royal, N. S., who has for many years, both as a director of the Association and as a lumberman, worked for forest conservation, was elected Vice-President. Mr. William Power, M. P., of Quebec, the new President, also believes that it is now the turn of Nova Scotia for a meeting.

There has never been a convention more generally accepted than this one, and everything points to one of the most successful and useful conventions in the history of the Association. Halifax, with its many attractions, historic, scenic and commercial, is one of the great convention cities of Canada.

THE INVESTIGATION OF ROSIN SIZE

Normally composed rosin size can be investigated both gravimetrically and also titrimetrically. According to Dalen the following simple analytical method is recommended, by which the total quantity of the rosin, the bound and the free rosin, as well as of the alkali is titrimetrically determined. For exact analyses the total rosin will be determined gravimetrically.

2—3 g. rosin size are dissolved in about 25 c.cms. hot water, the solution is poured into a separating glass of 300 c.cms. capacity and mixed therein with 50 c.cms. 1-10 standard sulphuric acid. The precipitated rosin is agitated with ether, and the aqueous solution run off without loss into a second larger separating glass; the etheric rosin solution is washed a second time with water and the washing liquid is added to the aqueous solution obtained first. The entire aqueous liquid is then shaken again with ether and finally poured into a flask. The unused sulphuric acid is titrated back in this with 1-10 standard soda lye. If m c.cms. alkali were employed for the titration then $50 - n$ c.cms. acid have been used for neutralising the alkali contained in the rosin soap. The composition of the soap is then calculated as follows:—

$50 - n$ 0.0031 = percentage of alkali calculated as Na_2O in grammes.

$50 - n$ 0.0302 = percentage of bound colophonic acid (molec. weight 302) calculated as hydrate.

$50 - n$ 0.0293 = percentage of bound colophonic acid calculated as anhydride.

For the purpose of ascertaining the free colophonic acid and the non-saponifiable rosin constituents the etheric solutions in the two separating glasses are united, the total rosin contained therein being titrated with 1-10 standard alcohol lye in the presence of phenolphthalein. If m c.cms. have been used for titrating the rosin, then, as 1 c.c.m. 1-10 standard lye corresponds to 0.034 g. rosin (colophonic acid + nonsaponifiable rosin), as found by experience,

m 0.034 = the percentage of colophonic acid and non-saponifiable matter (total rosin).

m 0.0302 = the percentage of colophonic acids,

m 0.034 - 0.0302 = m 0.0038 = non-saponifiable rosin.

$0.0302 - m$ = n 50 = free colophonic acid.

The mode of testing described by Dalen is intended for the investigation of normally composed rosin size. Special methods of investigation are required for testing those kinds of rosin size of which many have recently been put on to the market and which contain, besides rosin and sodium rosinate, other substances exerting an entirely different sizing action. Of these, and also size (glue, glutin), vegetable size (paste, casein, albumen, starch, dextrin, gummi arabicum) may be specially mentioned. Owing to the presence of those substances the investigation of rosin size is rendered considerably more difficult. As a rule, the desired goal is reached as follows:—first test the solubility of the size in alcohol. Normally composed rosin size dissolves freely in alcohol, and the above-mentioned admixtures are all insoluble in alcohol and can therefore be readily separated and quantitatively determined. For more exact determination that the matter insoluble in alcohol is in the presence of oil is the first place, because oil is a common admixture such as alkyl lauryl soap, etc., which have been added for softening the rosin solution directly in alcohol. It will be lacking here a test

with potassium or sodium in an incandescence tube (Prussian blue reaction) for testing as to nitrogen.

Two cases are then possible:—

1.—The Substances Insoluble in Alcohol are Free from Nitrogen.

In this case, glue, albumin and casein do not come into question, but starch, dextrin and gummi arabicum.

Starch will be met with most frequently. This can be detected at times microscopically by its characteristic shapes, and always by the occurrence of a deep blue color when treated with iodine solution. The starch can be separated approximately quantitatively in cold water from dextrin and gummi arabicum owing to its being dissolved only with difficulty. Thus when treating 3 g. of a mixture of equal parts of wheat starch, dextrin and gummi arabicum with 300 c. cms. cold water about 0.9 g. were recovered undissolved. A proviso for employing the separation method is, of course, that so-called soluble starch is not present. This is not met with, however, as an admixture with rosin size. Dextrin and gummi arabicum can be distinguished by their behaviour relatively to lead-vinegar. Gummi arabicum is thrown down as a lumpy precipitate, whilst dextrin remains in solution.

2.—The Substances Insoluble in Alcohol Contain Nitrogen.

In this case attention must primarily be paid to animal size (glue, glutin). More rarely will vegetable size with albumin or casein be met with. For recognizing the nitrogenous substance test its behaviour in the presence of water and acetic acid. Glue is completely dissolved in water, the solution is not precipitated by acetic acid in contradistinction to the other products either when cold or hot. The percentage of nitrogen in the animal size is, as a rule, about 18 per cent. and that of sulphur is trifling (0.2 to 0.25 per cent.) When heating with alkaline solution of oxide of lead sulphide is not separated, as is characteristic for vegetable size, albumen and casein. Animal size forms with tannin a double compound soluble with difficulty in water.

Albumin (egg albumin) is soluble in cold water just as glue is but is precipitated when heated, particularly after adding acetic acid.

Vegetable size (paste and casein do not in themselves dissolve in water, but only in the form of their alkali compounds. These are decomposed by acetic acid, albumin free from alkali being separated. Casein differs from all the other albumins by its considerable percentage of phosphorus, about 0.8 per cent., and being able to be precipitated by rennet.

If nitrogenous constituents have been detected in a rosin size in the above manner, adhesive substances free from nitrogen, such as starch, dextrin and gummi arabicum may, of course, be present in addition. Of these, starch is recognized most readily by the iodine reaction. For the purpose of testing for dextrin and gummi arabicum the nitrogenous compounds must first be precipitated by an excess of tannin solution. The precipitate is filtered off, the filtrate evaporated to dryness and put into a few cubic centimetres of water. Small quantities of the insoluble double compound of tannin are separated. These are removed and the aqueous solution is mixed with an abundant quantity of alcohol. The excess tannin is dissolved in the latter, whilst dextrin and gummi arabicum are precipitated.

The precipitation is more clearly characterised after dissolving in water by means of lead-vinegar (cf. above).

If no precipitate is obtained on adding alcohol, but at most a slight turbidity then dextrin and gummi arabicum are lacking. If the constituents insoluble in alcohol have been separated from a rosin size and tested in the described manner then it is necessary only to test the portion which is soluble in alcohol and which consists as a rule only of rosin and rosinate of soda. This investigation is performed in the customary manner and causes no difficulty.

BROWN WOOD PULP.

Among the new methods recently proposed for brown pulp without resorting to the grinding process, which requires great power, the roller crushing process of Rudolph Kron Austrian Patent 34,106 deserves special mention. It is well known that the ordinary mechanical process with steamed wood consists in a combined grinding and crushing action entailing much loss of power by friction. It also makes too much waste in the shape of very small fragments.

The Kron process consists in passing the steamed wood between rollers lying across the grain, and it seems likely to replace the older methods as effectually as the roller has replaced the millstone in grinding corn. The rollers reduce the wood to fibres which have lost all their hardness and stiffness, so that they will make good pulp even out of the hardest woods.

The necessary succession of roller pairs is contained in a machine called the softener. The rollers are made of the best chilled cast iron, and the surfaces of each pair are at adjustable distances from each other. The material is fed continuously to the uppermost pair, and leaves the lowest pair ready for the pug mill, whence it goes direct into stirring vats with the water sorted and refined exactly like ordinary mechanical pulp, and passed to the draining machines.

The advantages of the new method as compared with the older processes may be summarised as follows:

(1) Smaller power is required. While the production of 100 kg. of dry pulp requires from 6 to 8 horse-power by the old process, according to the character of the wood, only half that power is needed, under the same circumstances, in the Kron machine. (2) The quality of the product is better, as shown by microscopical tests. (3) The Waste is less, as the machines does not anticipate the work of the beating machine. (4) The process is more equally adaptable to various sorts of wood. While big pieces are wanted for grinding, the Kron process can be applied to all sorts of pieces, big and little. (5) The running expenses are less. In the Kron method the same man can look after the softener and the pug mill. Thirty horse-power will give 5,000 kg. of dry pulp per hour from logs. (6) The expense of sharpening and renewing grindstones is, of course, entirely avoided.—Zentralblatt.

MR. C. B. THORNE SAILS FOR EUROPE.

Mr. C. B. Thorne, manager of the Hawkesbury mill of the Riordon Pulp and Paper Co., Ltd., sailed for Europe on March 31, from New York.

It is the policy of the Riordon Co. to send a man to Europe every three or four years. Mr. Thorne will remain there four months studying conditions and new methods in Germany, Scandinavia and England.

SULPHUR CONSUMPTION IN SULPHITE.

It is a common practice to estimate the sulphur consumption in pounds per ton of finished pulp, and as the figures vary unreasonably in different factories, even in view of the fact that different woods require different amounts of sulphur, according to their content of cellulose. It appears that the average consumption in America is 280 lbs. per ton, the limits being 235 lbs. and 400 lbs., and the average elsewhere is about the same.

The question has been investigated by Mr. O. F. Bryant, the chemist of the Nekoosa Edwards Paper Co., Port Edwards, Wisconsin, who tried to determine irreducible minimum quantities of sulphur, provided no sulphur is lost. He was led to the conclusion that the indispensable part of the sulphur is that which combines with the lignine of the wood. Hence he had to determine how much sulphur the waste lye contained in the form of organic sulphur compounds, and also to compute the amount of the lye with the quantity of pulp produced. The factory in which he carried out his researches makes unbleached pulp from fir in boilers 42 feet high and 13½ feet in internal diameter.

A charge gives 16,000 lbs. of pulp and 25,000 gallons of waste lye. An analysis of the latter gave the following figures:

	Grammes per Litre.	Pounds per ton of Pulp.
Total solid residue	115.00	2,999
Loss by combustion of same.....	105.36	2,748
Leaving ash	9.64	251
Total sulphur	7.83	204
Sulphur as SO ₂	0.76	20

Composition of the ash:

	Grammes per Litre.	Pounds per ton of Pulp.
CaO	2.98	78
MgO	2.75	72
S	1.76	46

The specific gravity of the lye was 1.0425.

As the lye contained 204 lbs. of sulphur per ton of pulp, of which 20 lbs. was in the form of sulphuric acid, there were 180 lbs. of organic sulphur compounds in the lye per ton of pulp. If we had to regard the formation of SO₂ as essential, we must consider that the minimum of sulphur here indicated per ton of pulp is 204 lbs. Such, however, is not the case. The SO₂ is not formed during the boiling, and is only an accidental accompaniment of the process. This makes the 20 lbs. a loss, and reduces our minimum to 184 lbs.

Probably, this minimum is never reached in factory working, but many pulp mills ought evidently to be able cut down their consumption of sulphur considerably by paying attention to its combustion, and all the other details connected with its use. A factory that uses 400 lbs. instead of the theoretical 184 will surely find great difficulties in dealing with its waste lyes, and thus there is another powerful argument in favor of using less sulphur. It is undoubtedly possible to get far closer to 184 lbs. than 400 lbs. Even the 280 lbs. must be regarded as excessive and wasteful.

In the little country of Denmark there are 230 pulp or paper mills. In Canada, according to the latest available statistics of the Dominion Forestry Branch, there are only 48 pulp mills in actual operation. The Canadian mills are, however, many times larger than those in Denmark.



NEW PATENTS



Fluid Stuffing Box.

By George Ernest Miller, of Madison, Maine,
Patentee.

U. S. Pat. No. 1,073,273.

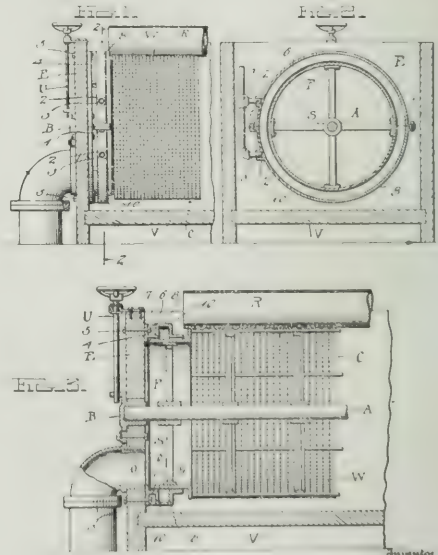
This invention relates to paper making, and more especially to cylinder machines; and the object of the same is to produce an improved stuffing box made in sectors which when assembled will inclose the extremity of the cylinder so as to prevent leakage of water and waste of the fibres and yet to avoid friction on and wear of the cylinder itself. This and other subjects are accomplished by constructing the stuffing box in the manner herein-after more fully described and claimed, and as shown in the drawings wherein

Figure 1 is a longitudinal section through one end of the vat, with the cylinder, couch roll, and stuffing box in elevation; Fig. 2 is a cross section on the line 2—2 of Fig. 1; Fig 3 is an enlarged longitudinal section through all parts assembled.

In the drawings I have illustrated my invention in connection with the cylinder of a paper making machine, although I do not desire to be limited to this use of the same. Such a machine as ordinarily constructed includes a water vat V having upright ends E through one or both of which are outlets O, and both of which carry bearings B which are rendered vertically adjustable by any suitable means such as upright screws U and bolts or screws for holding the bearing adjustably. In said bearings is journaled the axle A of a cylinder C having an open-work body surrounded by wire cloth W and reduced flanges F at its extremities each by preference mounted on a spider S which is secured to the axle A as shown; and the couch roll R rests upon the cylinder C and rotates it in the usual manner. As is well known to those familiar with the art, the vat contains water carrying fibres in solution, and when the outlets are opened and water drawn off from the interior of the cylinder there is a certain current below the water level in the vat tending to carry the water and fibres towards and into the cylinder C, with the result that the fibres adhere to the wire cloth W thereon and are carried around to the couch roll or felt, by which they are moved from the cylinder and eventually formed into paper sheets in a manner not necessary to amplify. Various attempts have hitherto been made to prevent the escape of the water and fibres in the vat around the ends of the cylinder and out the outlet O without its being passed through the wire cloth W, and yet such stuffing boxes as have been made and employed in this connection either set up so much wear on the exterior of the cylinder that the wire cloth thereon is soon torn to pieces, or the braking action on the cylinder is so great that the couch roll will not rotate it with ease.

No novelty is claimed for the parts thus far described, but I have set forth below the details of a fluid stuffing box which I prefer to use in this connection, although, as above suggested, it might be suitably adapted with equally good results.

Coming now more particularly to the details of the present invention, the stuffing box which I employ is by preference made of brass and in a plurality of sectors connected end to end by ears at their extremities through which pass bolts 1 as best seen in Fig. 2, each sector by preference having a boss 2 which is tapped to receive a pipe 3 through which fluid such as water may be fed into the same under pressure a little greater than the pressure of the water within the vat V. The advantage of making this stuffing box in sectors (of which two only are shown in Fig. 2) is that its sectors can be put in place within the ends E of the vats V and around the flange F of the cylinder C without removing the axle A of the latter from its bearings B. Assuming, however, that the sectors when secured end to end make up a complete ring, the body of the



stuffing box is of the cross section best seen in Fig. 3 and comprises a collar 4 bolted at several points as at 5 to the end E of the vat and preferably having an internal shoulder 6 fitting over the extremity of the flange F on the cylinder C a flat body 7 closely surrounding but just out of contact with said flange F, and therefore producing no wear when the cylinder is rotated, and a channeled member 8, preferably formed integral with the body 7 and disposed between the edges thereof with its mouth 9 opening toward the flange F and its base 10 pierced at suitable points with openings communicating through the bosses 2 with the pipes 3 by means of which the fluid employed is fed to the interior of this channel. Preferably such fluid is water, although whatever fluid is employed should

be under a little greater pressure than that in the vat. The cylinder is rotated by the means above described, or by any suitable means, and if the couch roll R rests upon the cylinder C its bearings B may need adjustment from time to time when they become worn.

In the use of this improved stuffing box, the parts are assembled by inserting the lowermost sector beneath the flange F and placing the uppermost sector above it, and connecting their ears by the bolts 1, and then connecting the flange 4 by the bolts 5 with end E of the vat. All this can be done without removing the cylinder from the vat, although doubtless it would be necessary to stop its rotation and withdraw the water from such shaft. When the parts finally assume the position shown in the drawings, the fluid is turned on through the pipe or pipes 3 so that it flows into the annular space within the channeled member or members 8, out of which it must and does leak slowly between the body 7 thereof and the exterior of the rotating flange F of the cylinder. But as the pressure of the fluid in this stuffing box is greater than the pressure of the liquid within the vat V, it will be impossible for any of said liquid to flow in a contrary direction, and if the fluid employed in the stuffing box is water the overflow thereof will mingle with the water and fibres in the vat without injury to the product.

Especial attention is directed to the fact that the parts of this stuffing box need not contact at any point with the flange F or the cylinder C, especially if the bearing B is properly adjusted, and if there is no contact there can be no friction and no wear, and the leakage referred to has been shown to be without objection.

What is claimed as new is

In a paper making machine, the combination with a cylinder having a concentric flange extending beyond its end and in communication therewith, of a vertical support located adjacent to the open flanged end of the cylinder, a bearing movably located within an opening formed in said support and adapted to be adjusted vertically, an axle passing through the cylinder with its end projecting beyond the flanged portion thereof and revolvably received by said bearing, an outlet passing through the support and communicating with the cylinder, a stuffing box surrounding the flanged end of the cylinder and including a body made of sections bolted together, said box being larger in circumference than the flanged portion of the cylinder, and means secured to the support for adjusting the bearing, whereby the flanged portion of the cylinder is accurately adjusted in respect to the stuffing box.

SULPHITE FIBRE.

Process for Making It from Resinous Woods Patented by Omar Carr, of Asheville, N.C.

Omar Carr, of Asheville, N. C., has been granted patent No. 1,089,691 on the manufacture of sulphite pulp from resinous woods.

Practically all resin-bearing woods store the greater part of their resin in the "summer" ring of the wood, the rest being stored in the medullary rays, says the inventor. Wherever the resins are stored the cellulose is stained yellow or yellow brown. In many varieties

of pine this stain is of such character that it does not dissolve out under the action of the sulphite "cook liquor," the stained fibres being only partially cooked and eventually showing in the pulp as "shives" or "yellow shiners." These pines are not, therefore, available for pulp by the sulphite process in their natural state; and as they are very abundant, of rapid growth, and of insignificant value for lumber or fuel use, it is economically desirable to render them suitable.

It is the object of my invention to attack the "yellow ring," or stained fibres, before subjecting the wood to the sulphite cook, the desirable characteristics of which, as compared with the soda process, are well known. This I accomplish by the use of turpentine and alkali in combination. The resins causing the stains are complex in chemical composition, some being acid in nature and soluble in alkaline solvent, while others act as neutral resins and are soluble in turpentine.

An outline of one general method of procedure is as follows: The wood is chipped in the usual way and the chips placed in an autoclave—one of a series; they are then extracted by turpentine, a large part of the resins responding to this solvent, heat and circulation promoting the result. Following the turpentine extraction I place on the chips a solution of alkali—common soda ash is convenient, but caustic soda is more effective, and by heat and circulation remove the remaining resins. The extraction may be conducted with the autoclaves as a series, interconnected, or intermittently, the alkali solvent may precede the turpentine, or the two solvents may be used together, the turpentine emulsifying with the alkali solvent.

A specific procedure may be as follows: A battery, or series, of autoclaves is employed, preferably eight in number and interconnected by appropriate piping and provided with heaters and valves. Numbers one to six will contain chips submerged in alkaline solvent, numbers seven and eight chips submerged in turpentine solvent. By means of compressed air the solvent in number one is forced forward, a "draw" of alkaline solvent being taken from number six; simultaneously fresh turpentine solvent is forced into number seven and a "draw" of such solvent taken from eight. Then number one is "dumped" of its charge of "spent" chips. Number eight is now connected with number one, and by running fresh alkaline solvent into number two circulation is forced through the battery and turpentine solvent from number eight is forced over into number one, saturating the fresh chips there. The battery is now ready for compressed air in number two, a "draw" of alkaline solvent from number seven; fresh turpentine solvent into number eight, and a "draw" of turpentine solvent from number one. Thus the extraction proceeds, the fresh chips being bathed in turpentine solvent and the nearly spent chips bathed in alkaline solvent. The "draw" of alkaline solvent contains resins as soaps, and residual turpentine; the turpentine is recovered by appropriate distillation, and by evaporation the resin soaps are obtained. The "draw" of turpentine solvent contains resins, and by distillation of the turpentine the resins are obtained in the "free" state. Whatever turpentine is confined in the wood primarily, is collected and appears in the turpentine reclaimed.

The "spent" chips are practically free of resin and yellow stain, and after draining or drying may be cooked by the conventional sulphite process.

Obviously the process may be reversed, the alkaline

solvent producing the turpentine solvent, while it is also apparent that the two solvents may be merged together and it is further apparent that the extraction may be accomplished in an intermittent manner instead of serially. The specific procedure described above, however, gives best results.

NOTES ON FOREIGN TRADE.

Paper for Turkey.

A United States consular report states that there is a good demand for paper in the Harput district of Turkey, and it will increase as the people become more educated. In this region every scrap of paper, particularly newspaper, is saved carefully, as it can be sold or used effectively in many ingenious ways. It is estimated that about £3,000 worth of paper is used in this district each year, most of it imported from Belgium. The common paper for writing is thin, ruled and double sheeted, 7 to 8 inches by 10, and costs from 5d to 1s 0½d per hundred. There is also in use, especially for writing Turkish, unlined paper, thicker and with double sheets, 8½ by 13 inches, costing from 7½d to 1s 8d per hundred. The experience with printing paper imported for the American College press at Harput has shown that it costs from 2d to 2½d per lb. to get such paper from America, not including the packing expenses in the United States or the customs duties of 11 per cent at the Turkish port of entry. Except for this press there is little demand locally for printing paper. Envelopes 4 by 5½ inches, of thin colored paper, cost from 4d per hundred up. There is a demand in this district for a coarse but not heavy paper, like that used for wrapping in the United States. In many of the houses of the poor and the villagers oiled paper is used as a substitute for window glass. For 100 sheets 12 by 18 inches the local price is 2s 1d up. With the progress of education and business requiring notebook, account-books, note paper, letter paper, wrapping paper, envelopes of all sizes and weights, there will doubtless be a large demand for all kinds of paper manufactures and materials. The imports of paper to Canada amounted in value to \$6,260,000 in 1912, as compared with \$5,490,900, in 1911. The increase was principally in packing paper and paper hangings.

PRICE BROS.

The Kenogami Mills' Earnings Now Over Bond Interest.

M. H. C. Price, secretary of Price Bros. & Co., in an interview states that the new Kenogami mills are now earning more than the bond interest. "The operation of these new mills is now very satisfactory indeed," Mr. Price said. "During the last few weeks they have been operated practically at full capacity. Orders are coming in well and we look for not only meeting of bond interest, but also for a substantial surplus on the stock to be earned by the Kenogami mills this year."

Shipshaw Water Power Co.

The Shipshaw Water Power Co. which is being developed by Price Bros. & Co. is located on the Shipshaw River at Montreal Falls about two miles from Kenogami. The present production of the company is about 1,000,000 k.w.h. It is proposed to develop 10,000,000 k.w.h. which amount has been

contracted for by Price Bros. & Co. at \$15 per h.p. This will give gross earnings of \$75,000. The entire common stock is owned by Price Bros. & Co., who will, therefore, control the Shipshaw Water Power Co.

AMERICAN PULP & PAPER ASSOCIATION CHARGES.

(Special to Pulp & Paper Magazine.)

New York, N.Y., March 25, 1914.

A meeting of the executive council of the American Paper & Pulp Association, of which Arthur C. Hastings of 50 Church Street is president, has been called for April 2 at Chicago, Ill., to discuss amendments to the by-laws and other important subjects. "The proposed change," said Mr. Hastings to-day, "to create secretaries for the several divisions and probably a general secretary of the association. The office of president will be a nominal one, as I understand it, and most work will be in the hands of the general secretary and the divisional secretaries under the proposed organization."

Reports from some of the larger divisions that have thus far been submitted to the president show that the feeling is very strong for the maintenance of the association and also a willingness to liberally subscribe to the support of the organization.

The wrapping division will hold a meeting in Chicago at the same time and final arrangements for the changes in its organization will voted upon.

LAURETIDE COMPANY.

Work will be started on the new power development operation of the Lauretide Company at Grand Mere, Que. From 800 to 1,000 men will be given employment and the work will be rushed in the hope that the construction programme being undertaken will be completed before the end of 1914.

ONTARIO GOVERNMENT BUYS TIMBER LIMITS.

The Ontario Government has secured an option upon timber rights in a large section of the limits of the Pembroke Lumber Company in and immediately adjoining the Algonquin National Park.

The limit taken over, and by order-in-Council brought within the park, is chiefly valuable to the province from the fact that it contains a splendid stand of young pine. The fact that this pine will not be large enough to purchase it at a reasonable figure, the price agreed upon being \$185,000, compared with \$200,000 enough for cutting for some years enabled the Government to take over the rights of the Munn Lumber Company three years ago.

INTERNATIONAL PAPER.

Net revenue of the International Paper Co. for 1913 was \$2,984,110, a decrease of \$254,249. The surplus available for dividends was \$994,895, a decrease of \$203,873. Preferred dividends of 2 per cent, amounting to \$48,134 were paid, leaving a surplus for the year of \$545,671. Total surplus is \$10,941,294.

The balance available for dividends on the preferred stock was equal to 4.43 per cent, as against 5.34 per cent in 1912.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

London, March 14, 1914.

It is announced that the coating machinery for St. Anne's Board Mill Co., Ltd., Bristol—a new mill that has been erected to supply the needs of the Imperial Tobacco Company, Ltd.—will be supplied by Messrs. Grahl and Hoebl, of Dresden, Germany. The color mixing and color straining machines are of the latest type, the coating machinery, including the drying arrangement, combining modern improvements adapted generally for coating cardboards in the reel. The coating room of this new mill is about 200 feet long by 54 feet wide and 11 feet high. The finishing machinery, such as calender and cutting machines will also be supplied by Messrs. Grahl and Hoebl. Another piece of interesting machinery will also be seen at the forthcoming printing and other trades exposition, to be held in the Agricultural Hall, London, when the Swift patent paper curing machine will be seen work. This invention has been placed on the market by Messrs. H. O. Strong & Sons, Ltd., of Bristol, and it is reported on as being very effective in reducing paper troubles, maturing any ordinary class or condition of stock with speed and economy.

A Successful Mill.

At the annual meeting of C. Townsend Hook & Co., Ltd., the president of the company—Captain J. C. Baxter—said that considering the great rise in the price of coals and chemicals, and of the raw materials used in the manufacture of paper, and the extremely low price of paper during last year, the result of the trading for the year 1913 must be considered satisfactory so far as his firm was concerned. Owing to the necessity of carrying larger stocks of wood pulp and other raw materials on account of the constant strikes, a larger amount had been carried forward than last year, and the item "stock-in-trade" and raw materials was much larger, about \$43,200. William Dedrick, managing director of the company, said to-day they had no increased capacity for papermaking, their mill being now a four-machine one, and their latest machine was one of the best that could be obtained. After hearing the various reports, Captain Baxter proposed that a dividend of 6 per cent. per annum on the preference shares up to December 31st last be paid; also, that a dividend of 7 per cent. for the year 1913 be declared on the ordinary shares of the company, less income tax, payable on March 4. The report and the balance sheet were adopted and Captain Baxter was re-elected a director of the company.

A Useful Society.

The annual meeting of the Stationers and Paper Manufacturers' Provident Society was held the other day, Sir Thos. Vezey Strong presiding. The report submitted dealt with the steady progress of the Society which is in a very sound financial position. The invested funds amount to £46,761 10s. 7d., made up by a general fund of £40,086 15s. 10d. and a residence fund of £6,674 14s. 9d. The payments for the year 1913 amounted to £878 11s. 1d., which included annuities £625 5s. 11d., residence fund £198 5s. 2d. and funeral expenses £55. Paper men as a rule in England make every

effort to enhance the good work of their various societies and the Stationers and Paper Manufacturers' Provident Society is one that always appeal for support and admiration.

New Quality Paper.

Messrs. John Dickinson & Co., Ltd., of London, have added to their large range of art papers a new quality which is reported to be of exceptionally thin substance and specially made for illustrated catalogues. An unusually large number of pages can be worked into a catalogue when the paper is used. This firm now stocks the following sizes and weights which may probably help Canadian papermakers: Double crown 20x30 ins., 31 lbs.; quad crown 30x40 ins., 62 lbs.; double royal 25x40 ins., 52 lbs.; double medium 23x36 ins., 43 lbs.; quad medium 36x46 ins., 86 lbs. There are 516 sheets to the ream and the price of the paper is 7 cents per lb.

British Trade Declines.

The Trade Board returns for February show that the recent statement appearing in the Pulp & Paper Magazine, viz. that British paper mills are not enjoying a brisk period of late, are fully borne out and that a wave of dullness is passing over the industry. The following show the exports from British mills of writing, news print, printings, packings and wrappings, paper hangings, coated papers, card and other boards, envelopes, etc., for February:

	Cwts.	£
Exports, February, 1914,	256,375	273,758
Exports, February, 1913,	228,316	310,899
Exports, Jan. Febr., 1914,	592,769	606,296
Exports, Jan. Febr., 1913,	611,247	645,743

To Canada 368 cwts. of printing paper was exported in February as against 612 cwts. in Feb., 1913, and for January-February 843 cwts. compared with 1,071 cwts. in 1913. In printing paper there is also a notable reduction in February, the figures being 4,983 cwts. as against 12,253 cwts., and for January-February 11,841 cwts. compared with 25,509 cwts. in 1913. In the imports of all classes of paper, including boards the returns show: February, 1914, 936,753 cwts., valued at £575,417; February, 1913, 1,950,111 cwts., valued at £618,067; January-February, 1914, 1,927,999 cwts., £1,206,460; January-February, 1913, 2,040,389 cwts., valued at £1,229,766. During February no printings or writing were exported to the British market from Newfoundland. Except for paper on reels, the quantity received from the States mills also shows a decline in February, and except for a small quantity in fine writing and printing papers the exports from the British mills to the States markets also show a substantial decline.

Wood Pulp Slow—Canada's Exports Raised.

The position of wood pulps in the Trade Board returns is not to say satisfactory. The imports from all sources are as follows:

	February, 1913.	February, 1914.		February, 1913.	February, 1914.
	Tons.	£		Tons.	£
Chemical,	21,503	171,835		11,512	119,872
Mechanical,	34,967	81,658		38,459	84,233

January to February.

	Tons.	£	Tons.	£
Cechnical	54,765	431,440	50,023	399,185
Mechanical	77,952	183,923	78,459	175,034

In February mechanical was imported at English ports to the extent of 4,308 tons, compared with 384 tons in February, 1913, whilst the figures for January to February are 12,441 tons. It is very gratifying to see these figures against the name of Canada in this particularly dull month of February.

ABITIBI ISSUE.

An issue of \$2,500,000 6 per cent. first mortgage serial gold bonds of the Abitibi Power and Paper Company, Limited, of Iroquois Falls, Ont., is being made by Messrs. Peabody, Houghteling and Company, Chicago.

These bonds are to provide funds for the completion of the company's mills and for working capital. They are secured by an absolute first mortgage upon all the property now owned, or that may hereafter be acquired, by the Abitibi Power and Paper Company, including its water power rights on the Abitibi River, timber limits, pulp and paper mills, of an annual capacity of 65,000 tons.

The total authorized capital of the Abitibi Company is \$13,000,000, of which \$9,500,000 has been issued, leaving \$2,500,000 bonds and \$1,000,000 preferred stock unissued.

The company controls under lease from the Government of Ontario, the property known as the Abitibi pulpwood limit, consisting of approximately 1,000,000 acres of pulpwood lands situated along the upper and lower Abitibi lakes, and along the Abitibi River and its tributaries in the District of Temiskaming. Under its grant, the company is obliged to pay the Government in advance, each and every year, for the right to cut and remove pulpwood, the sum of \$5,000. These payments have already been made for five years in advance. In addition the company is required to pay 40 cents per cord for spruce and 20 cents per cord for other pulp-making woods. The company's lease is in the standard form, running for a period of twenty-one years, and can undoubtedly be renewed from time to time thereafter, in accordance with the invariable practice of the Ontario Government.

The Abitibi pulpwood limit contains 5,000,000 cords of spruce and other paper-making woods, and the Abitibi watershed above Iroquois Falls contains over 15,000,000 cords of pulp-making timber. A complete newspaper plant, with accompanying groundwood and sulphite mills is being constructed at Iroquois Falls, having a capacity of 65,000 tons of new print paper.

HOWARD SMITH PAPER MILLS ENTERTAIN.

Mr. Smith and the directors of the Howard Smith Paper Mills, Ltd., entertained, about two hundred, friends of the company on Friday, March 27, to a trip to their new mills at Beauharnois, Que. The special train left Wharfedale Station, Montreal, at noon and they went directly to the mill, spending the afternoon looking over the new plant. Mr. H. C. Courtney the General Superintendent explained the new features of the mill to the guests, who were delighted with the cleanliness and efficiency of the plant. The grades of paper they have been turning out are meeting with the most enthusiastic reaction on the market so that they are already planning on installing a second machine.

The first mill is in the old buildings of the Dominion Wood Pulp Co.

H. FULLNER, WARMBRUNN IN SCHLESSEN.

The remarkable development of the firm, H. Fullner, Warmbrunn, is the result of the excellence of its products. On this also depends the confidence which paper, carton, pasteboard, cellulose and woodstuff manufacturers have in Fullner machines, which are used successfully in all the civilized countries of the world. The importance of the Fullner workmanship can best be judged by its continually increasing big pieces of work. In 1913 alone there were begun, finished and also set up in working order, 30 paper machines, 4 long sieve draining machines, 5 roundsieve carton machines, 3 gelatine sizing machines, 14 calendars, 26 cutting machines, 22 "Kollergangs," 67 Hollanders, 70 knot catchers, 25 patent Fullner filters.

In order to supply the increased demand last year the mechanical department was enlarged by modern equipment and the addition of a paper machine-equipping room, which is furnished with 23 motor travelling cranes and very modern tool machines. Provision has been made for the future so that the widest machines can be completely set up in the work room and can be delivered more quickly than formerly.

In all the important exhibitions the firm of H. Fullner has been given the highest praise. The world exhibition for book trade and graphic 1914, May to October, in Leipzig, will be of increased interest to the assembled business world because in the group of "paper production" every day it gives ample opportunity to all those desirous of seeing a modern, complete Fullner paper machine in running order. This paper machine with 2,700 mm. sievebreadth, has a wire section 20 metres long, as well as an arrangement for raising and lowering the wire section. The end is made of 26 cylinders. The machine, which is already sold to a Central Germany paper mill, serves for the manufacturing of woodfree, medium, copy and rotary press paper and is geared for a speed of a minimum of 10 and maximum 150 metres per minute, combined with the paper machine are two patent Schacht-Hollanders, a Fullner roller and a patent Fullner filter so that, since printing presses as well can work in connection with it, the whole process of paper from raw material to the printed sheet is shown.

The Fullner machines will without any doubt form a great drawing card for the Leipzig Exhibition and a brilliant and powerful proof of the exemplary trial work and great working capacity of the Fullner plant. The period of the sixty years of the firm of H. Fullner, 1914, has a fitting close in this exhibition of the Fullner paper machine.

DEATH OF JOHN NORRIS.

The announcement of the death of John Norris, chairman of the Committee on Paper of the American Newspaper Association, came as a great shock to all members of the newspaper and paper manufacturing world. He died at his home in Brooklyn after several months of ill-health on March 21st and closed without doubt the most important career of any single man in the news print and publishing industries in the United States. He was always most energetic, forceful and enthusiastic about obtaining his points and carrying out his plans. His acquaintance among paper manufacturers was very broad and he was known throughout the United States and Canada. John Norris was the leader of the campaign for free paper in the United States during the last tariff discussion and as such showed his ability as an organizer and worker. As Business Manager of the "New York Times," he also demonstrated his ability to carry on big things.

PULP AND PAPER NEWS

The Northumberland Paper and Electric Company Limited, of Campbellford, Ont., have disposed of their ground wood plant to the Seymour Power and Electric Company, Limited, who will take possession on April 1st and operate it thence forward. Elie Brunelle, who was for a number of years with the Price, Porritt Paper Company, of Rimouski, Que., has been appointed manager. L. A. Burbank has been appointed superintendent, which position he held with the former owners ever since the mill was built about four years ago. The Northumberland Paper and Electric Company intend improving and enlarging their box board mill during the coming summer.

The Canadian Alkali Company have had plans prepared for a five-hundred-thousand-dollar factory at Sandwich, Ont., and the town has granted the usual exemption to new industries. The company will employ between three and four hundred hands at the start and the pay roll will amount to \$150,000 annually. Caustic soda and other chemicals will be manufactured.

In the Ontario Legislature, recently, Z. Mageau, M. P. P., charged that Sturgeon Falls was being robbed of its natural water powers, the trouble arising out of the fact that in 1910 the Cobalt Hydraulic Company were given the right to divert the waters of Lake Temagami into the Montreal river to increase the water power there. The diversion of the natural current, according to Mr. Mageau, has robbed Sturgeon Falls of sufficient water power and is decreasing the usefulness of the various water falls along the route of the Sturgeon river. The member charged the Minister of Lands, Forests and Mines, Hon. W. H. Hearst, with neglect in not seeing that the current was changed back to its natural course. So far as the Spanish River Paper Mills at Sturgeon Falls are concerned, T. H. Watson, Managing Director of the Company, states that they have sufficient water and their industries there have in no way suffered.

It has been virtually decided that the Empire Press Conference will be held in Canada in 1915, instead of this year, and an official invitation has been forwarded by the Canadian committee to the Empire Press Union. It is understood that the Canadian Government will co-operate with the Canadian Press Association to ensure the success of the conference and the adequate entertaining of the delegates. In addition to leading journalists from Great Britain an effort will be made to secure a full representation from Australia, New Zealand and South Africa. It is understood that the actual conference will be held in Ottawa and that the distinguished visitors will be taken for a trip across the continent to British Columbia, which province has invited the delegates to be the guests of the provincial authorities.

The Ontario Government is determined on better fire protection in the northern part of the province and a bill has been introduced into the Legislature by Hon. W. H. Hearst, Minister of Lands, Forests and Mines, to enable the department, on application from a municipality in a provisional district to notify the owner to clear away bush bordering on a town. On his neglect

or refusal to do so, the department may have the work done and the cost charged to the owner. When the land is situated in an unorganized municipality the work may be done and charged against the land as local taxes. Mr. Hearst says that the bill is necessary because many owners of such land who often live in the older parts of the province refused to go to the expense of clearing the timber off their property and thus their action constituted a great fire risk to the small settlement.

The assets and good will of the George Powley Paper Company, of Toronto, who recently made an assignment to F. C. Clarkson, have been purchased by R. J. Weatherhead, of Toronto. He is widely known to the paper trade in Canada and the United States with which he had been connected in various important capacities for forty years. Several years ago he was manager of the Royal Paper Mills at East Angus, Que. Mr. Weatherhead began his career with the Smith Paper Company, at Lee, Mass., where ground wood pulp was first converted into paper, being brought down from Curtisville, Mass. He was also employed in paper mills in Holyoke, Mass., Wisconsin, the Southern States, Maine, New Hampshire, Quebec and New York. The name of the Powley Paper Company will be changed to the Weatherhead Paper Company. The company have several travelers and handle all kinds of wrapping papers, twine, matches, etc. All the old staff is remaining with the new firm.

John A. Graham, of London, who for several years was a traveller for H. T. Reason & Co., Paper Box makers of that city, was among the victims who met death in the recent fire in the Woodbine Hotel, in Toronto. He was thirty years of age and had resided in London for ten years.

Eric Buckler, of Calgary, who has been spending some time in England, has sailed for home with a member of the great china manufacturing firm of Doultons, to examine the china clay deposits of Southern Alberta and possibly to start a factory.

The big storm of November last did much damage to certain timber limits, both those owned by the Crown and others in the hands of private parties in Northern Ontario, and, under the present act, limit-holders are not allowed to export pulp wood taken from Crown lands unless manufactured into pulp or paper. The saw mills are over supplied as a result of prevailing conditions, and a bill has been introduced in the Ontario Legislature by Hon. W. H. Hearst, Minister of Lands, Forests and Mines, providing that, for a limited period not extending beyond the end of the present year, the exportation of pulp wood cut from Crown lands will be permitted. This proposal suspends for the time being the prohibition of pulp wood exports from Ontario. It is believed, that in view of the unusual circumstances, the bill will pass without opposition.

The Cornwall Canal has been unwatered for a few weeks while extensive improvements will be made to Lock 20. A concrete retaining wall will be built there and also over the old Lock 19, which will do away with the expense of maintaining gates. During the progress

of the work, which will last until the middle of April. The Toronto Paper Manufacturing Company's mill at Cornwall, which draws its power from the canal, will be closed down. In the meantime the plant will be given its usual clearing and overhauling.

The Workmen's Compensation Bill is now before the Ontario Legislature and is being opposed in many of its features by the Canadian Manufacturers' Association, liability assurance corporations, special groups of employers and even the physicians are complaining of the provisions of the act. In the scale of benefits and awards, which come to the workman or his family for injury or death, which points offered the greatest controversy between the labor interests and the Canadian Manufacturers' Association, when the evidence was being submitted to the Commissioner, Sir William R. Meredith, the Government have adhered strictly to the draft bill. This, in itself, is a compromise between the demands of the two parties. The labor interests asked high benefits and the manufacturing interests insisted upon a much lower rate of liability, and the Commissioner struck a midway figure between the two scales. The amount of indemnity is fifty-five per cent. of the wages of the workman for partial disability up to \$2,000, and \$20 per month for the widow in the case of death of the husband with five dollars additional for each child up to three children. There is no option given for going outside the groups and considerable detail is involved in this branch of the bill. There is a mass of provision for the working out of the act.

The Associated Ad. Clubs of America, who will hold their annual convention in Toronto from June 21 to 25, will, it is expected, attract between six and seven thousand men representing American capital of \$1,600,000,000 and an immense amount of British capital as well. The sum of forty thousand dollars is being raised by the Toronto Ad. Club for the purpose of entertainment and showing the visitors the advantages of the city. William Jennings Bryan, Secretary of State for the United States, will be the guest of the Associated Advertising Clubs and will address a mass meeting in Massey Hall on the afternoon of June 21.

The annual convention of the Canadian Press Association will be held this year at the Royal Muskoka Hotel, Muskoka Lakes District, on June 26 and 27. This will be the first meeting since the merging of all the other press Association of Canada in the C. P. A. There will be a radical departure this year in connection with the programme as there will be few set addresses, but the Executive, Advertising and other committees will submit a number of definite issues for the consideration of the convention.

The Timiskaming and Northern Ontario Railway Commission have issued a special report applicable and covering what is known as the pulp woods in Northern Ontario. The report shows that the T. and N. O. Railway is carrying pulp woods at a rate very much lower than any other line in Canada. As, it was felt, that as a colonization railway, the Commission should adopt the lowest possible rates. Chairman Englehart gives some advice on the nature of the settlers desired who could make a success of settlement in Northern Ontario.

"Those who are willing to work and will bring their own tools, their shovels into the lands of the north." He stated that the pulp woods are the "asset or saving bank of the settler" and concludes that the settler willing to work will be virtually assured of a clearing with no further cost than the labor expended. Pulp wood and land reserved will cover the cost of the clearing. Mr. Englehart places the average price at ten cords of pulp wood to the acre and says that prices alongside of the

railway for pulpwood vary from \$4 to \$5.50 per cord. Any person of age and willing to work can secure a 160-acre lot at fifty cents an acre, payable in instalments.

The Stanworth Paper Company, of Toronto, has been granted a federal charter with a capital stock of \$250,000 and is authorized to do a general power distribution and power development business. W. J. Simpson, Stewart W. Hall, R. E. W. Duke, Alfred Wales and H. G. Hammond are the incorporators.

The Canadian Live Stock News, Limited, of Toronto, with a capital of \$40,000 has been incorporated and will publish a paper devoted to the interest of live stock owners, buyers and breeders. Reginald C. Smith and Victor Ross are behind the new publication.

Ewald Hinsberg, representing Thomas Josef Heimbach, Duren, Rheinland, Germany, manufacturers of all kinds of papermakers' felts, spent a few days in Montreal and Toronto recently on business. In Toronto he was the guest of J. L. Chambers, Canadian representative of the firm.

Work has been started on the new publishing quarters of the Methodist Book and Publishing House on the block bounded by Queen, John and Richmond streets, Toronto. The present building will be five storeys high and will be erected of brick, concrete and terra cotta and the supports and wall will be strong enough to carry another five storeys when required. The cost of the new home will be \$600,000.

G. P. Grant, formerly President of the Spanish River Pulp and Paper Mills Co. and the Toronto Paper Manufacturing Co., and for many years associated with the Dominion Bond Co., has along with A. E. Dean, lately head of the statistical department of the Dominion Bond Company, commenced business under the name of Grant, Dean & Co. They will carry on work as general financial agents in Toronto.

Philip J. Ackerman, of Toronto, while touring the Southern States in the interest of the International Papermakers of America, died recently. Mr. Ackerman, who was for some years connected with one of their publications which had an office in Toronto, was well known to the trade.

F. N. Burt Co., Limited, of Toronto, manufacturers of paper boxes, sales check books, blank books, shipping tags, etc., have declared their regular quarterly dividend of one and a half per cent. on the common stock and one and three-quarter per cent on the preferred. The profits for the past year were \$217,302, or an increase of \$27,872. The annual meeting of the company will be held in Toronto on March 30. A comparative financial statement for the past two years is as follows:

	1912.	1913.
Mortgages pay	\$ 33,000	\$ 31,000
Bills pay	273,904	221,000
Realty and plant reserve . . .	75,000	100,000
Profit balance	137,874	145,635
Real estate	2,285,626	2,423,596
Stock	353,585	387,552
Bills receivable	264,802	367,786
Cash	86,744	90,533

After the payment of the dividends and allowing twenty-five thousand dollars for plant depreciation a balance of \$7,761 remains.

Edgar Russell Smith, one of the veteran journalists and publishers of the Province of Quebec, who directed the News of St. John's for over half a century, passed away recently. He was the father of C. Howard Smith, President of the Howard Smith Paper Mills, of Montreal.

Fire broke out recently in the engine room of the planing mill of the Laidlaw Lumber Company, corner of Eastern avenue and St. Lawrence street, Toronto, right in the center of a large yard containing thousands of feet of lumber. The flames were confined to the planing mill. The loss on the mill and machinery was \$30,000 and on the lumber stored in the building about \$20,000.

Thorold, which has come to the front in recent years in a pulp and paper sense, still goes on acquiring industries and, although no more paper concerns have been landed, another company who will erect an abrasive works, have decided to locate there. They will employ one hundred and fifty skilled hands. A by-law will be voted upon by the ratepayers of Thorold Township on April 2nd, to grant a site and exemption to the company. The location is near the Welland Canal, just outside the town limits.

Under an act recently passed by the Ontario Legislature, the townships of Stratton, Bronson, Guthrie, Barron and Edgar and all lands in the townships of Fitzgerald, White and Niven, not included in Algonquin Park, are to be added and the statute applied to such lands for the protection of fish and fur-bearing animals. In all the townships the lands unsuited for settlement are withdrawn for the purpose above mentioned.

The annual report of the Provincial Hydro-Electric Power system has been presented to the Ontario Government. It shows that 357 miles of lines are completed and that 198 miles are under construction. The total capital invested is \$5,915,724, while the province has advanced to the \$6,922,646. Of this amount \$5,190,858 has been expended on the Niagara system. The mileage of the different systems is made up as follows: Niagara 378, St. Lawrence 45, Simcoe 67, Wasdell's Falls 65. Forty-five towns, cities and villages are considered to be under the direct control of the Hydro as against twenty-eight at the close of 1912. Combined, they brought in a revenue of \$2,000,000 and made a total profit of almost \$400,000 after all just charges and depreciations had been accounted for. The number of consumers for both light and power is 16,687 and the value of the entire plant, including all additions to the end of last year, is placed at \$9,164,483. A detailed statement of the flow of many rivers in Northern Ontario, which have been examined by the Commission as possible future power sites, is given.

A writ has been issued at the instance of the Town Council of Fort Frances against the Ontario and Minnesota Power Company for the amount of taxes levied during the years 1911, 1912 and 1913, which are still unpaid. The company objected to paying on the full assessment levied for some years for these goods and appealed the case for 1911 to the Ontario Railway and Municipal Board. After two hearings, an appeal to the Court of Appeal was made by the Power Company and the amount of assessment, which had been recommended by the Town Council of last year, was affirmed by the court. As the Council had also recommended that a settlement on the same basis be made for 1912, the Power Company on receipt of the decision of the court offered to pay the taxes on the basis of the court's decision. As the decision was for 1911 only, the present Council objected to a settlement in this way and hence the present action.

The Abitibi Pulp and Paper Co., Iriquois Falls, Ont., will install four paper machines as follows: Two 158 inches wide, one 184 inches wide, and one 202 inches wide.

RIORDON PULP.

Profits of the Riordon Pulp and Paper Company for the year ended December 31, 1913, were \$309,679, an increase of \$2,845 over 1912. After deducting \$48,953 for depreciation reserve and \$32,652 for interest on bank loans, there remained net profits of \$228,073, an increase of \$1,824. After payment of bond interest and preferred stock dividends, a balance of \$68,073 was added to profit and loss surplus, making a total of \$157,301.

The balance sheet shows total assets of \$8,670,852. Current assets amounted to \$1,866,314, an increase of \$420,000 over 1912. Inventories, etc., make up \$1,577,010 of this total. Current liabilities total \$1,258,037, an increase of \$896,000. Bank loans at December 31, 1913, amounted to \$700,020, as compared with \$80,000 a year previous. Bills and accounts payable also show a large increase. It is stated in the president's report that \$500,000 of bonds will be issued to replenish the depleted working capital.

President C. Riordon, in his annual report to the shareholders, stated that about 84 per cent. of the company's production for 1914 is already sold at satisfactory prices. The outlook for the company's business for the current year was very good.

The shareholders will be asked at a special meeting of the company following the annual gathering on April 1, to approve of changes in the by-laws respecting the borrowing of money.

Although it is stated that no new financing is being considered by the directors, it is pointed out that the by-laws governing the borrowing powers are restricted in scope, and that it has been decided to have them altered.

INTER OCEAN NEWSPAPER CO.

(Special to Pulp & Paper Magazine)

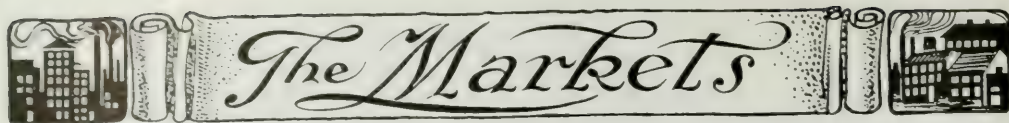
Chicago, Ill., March 25, 1914.

As a result of the complications growing out of its litigation regarding the revaluation of the lease of the ground occupied by the Inter Ocean building and other legal entanglements, application has been made in the United States District Court here for the appointment of a receiver for The Inter Ocean Newspaper Company. Judge Carpenter appointed as receiver Herman H. Kohlsaatt, president of The Inter Ocean Newspaper Company. Mr. Kohlsaatt, at once took possession of the property of the company.

The bill under which the receiver was appointed was filed as a chancery proceeding instituted by the Lake Superior Paper Company of Sault Ste. Marie, Canada, which held a claim against The Inter Ocean Newspaper Company for print paper, and was assented to by the officers of the newspaper company. The bill stated that because of the controversy with reference to The Inter Ocean building and the land on which it is situated and because of other conflicting claims the appointment of a receiver was made necessary in order to conserve the property and preserve its business and good will as a going concern.

The appointment of Mr. Kohlsaatt as receiver will make no change in the conduct of The Inter Ocean.

The remodeling of the plant of the Dryden Timber and Power Co. has been completed and the mill is now in operation. The evaporator of the Swenson Evaporator Co. was entirely remodeled and is now up to the increased capacity.



Canadian Markets.

The market situation remains much the same in all lines of paper as it has been for several weeks. News print mills are well employed and price conditions remain unchanged. A recent return shows that the average consumption of news print in the United States during the past year was 4,995 tons per day, and the total increase in 1913 over that of 1912 was 289 tons. Canada is now producing, according to the most conservative estimates, about fifteen hundred tons per day, and a forecast shows that within the next two years, if present plans materialize, there will be an added production of about 800 tons, which will make the total output in the Dominion around twenty-three hundred tons per day. This year there will come on the market 360 tons by reason of the putting in operation of the new mill of the Ontario and Minnesota and Ontario Power Co. at Fort Frances and the two machines of the Powell River Pulp and Paper Co., while the Belgo-Canadian Co. will augment their capacity by fifty tons, and the Brompton Pulp and Paper Co., with their new machine, will add another sixty tons.

The following memoranda will prove of interest to the Canadian trade:—

Consumption of Newspaper in the United States.

Year.	Total.	Increase over Previous Year.	
		Per Day.	Total.
1910	1,280,000	4129	
1911	1,372,500	4427	92,500
1912	1,459,000	4706	86,500
1913	1,548,300	4995	89,300
Average			89,430

Future Increases of Canadian Production.

Ontario & Minnesota Power Co., Fort Frances, Ont.	150
Abitibi Pulp & Paper Co., Iroquois Falls, Ont.	225
Belgo-Canadian P. & P Co., Shawinigan Falls	50
Donnacona Pulp & Paper Co., Donnacona, P.Q. . . .	50
Brompton Pulp & Paper Co., Brompton, P.Q. . . .	60
Laurentide Co., Grande Mere, Que.	100

Imports of Newspaper into United States.

	Total.	Per Day.
January, 1913	12,373	458
January, 1914	23,769	880
Increase	11,396	422

Book, writing, kraft and wrapping paper mills are fairly well employed, but orders are not as plentiful as they were toward the close of the year. The jobbing houses report a good business for March, and some of them have cancelled last year's record for the corresponding month. The demand for ground wood pulp remains strong, sulphite pulp is active, and prices are firm. In the top end paper stock market there is a moderate amount of trade. Book stock having gone up a little in price, but ordinary literature did not show the same feeling. Much business was done. Most of the orders are for small amounts in all lines.

The following quotations prevail f.o.b. Toronto:—
News rolls \$1.95 to \$2.00 at mill in car load lots.
News sheet \$2.10 to \$2.15, at mill in car load lots.
News (sheet) \$2.25 to \$2.50 at mill in less than car load lots.

Book papers (carload) No. 3, 3.75c to 4.25c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book papers (ton lots) No. 2, 4.50c to 5.25c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 6.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, \$2.00 to \$2.50.
Fibre, \$2.75 to \$3.50.

Manilla B., \$2.40 to \$3.50.
Manilla, No. 2, \$3.00 to \$4.00.
Manilla No. 1, \$3.25 to \$4.25.
Un glazed Kraft, \$3.75 to \$4.50.
Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood (at mill), \$15 to \$15.50.
Ground wood, \$21 to \$23, delivered in United States.
Sulphite (unbleached), \$42 to \$43, delivered in Canada.
Sulphite (unbleached), \$42 to \$44, delivered in United States.
Sulphite (bleached), \$56 to \$57, delivered in Canada.
Sulphite (bleached), \$57 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90.
No. 1 soft white shavings, \$1.75.
No. 1 mixed shavings, 50c.
White blanks, 92½c to 95c.
Ordinary ledger stock, \$1.15 to \$1.20.
Heavy ledger stock, \$1.40 to \$1.50.
No. 1 book stock, 75c.
No. 2 book stock, 45c to 50c.
No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
No. 1 print Manillas, 60c.
Folded news, 45c to 50c.
Over issues, 50c to 52½c.
No. 1 clean mixed paper, 30c.
Old white cotton, \$2.50 to \$2.75.
Thirds and blues, \$1.30 to \$1.32½.
No. 1 white shirt cuttings, \$5.00 to \$5.25.
Blue overall cuttings, \$3.50 to \$3.60.
Black overall cuttings, \$1.75.
Black linings, \$1.75.
New light flannellettes, \$4.75.
Ordinary satinets, 75c to 80c.
Flack, 90c.
Tailor rags, 70c to 75c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
Ram News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
No. 1 Book, 5½c to 6c per lb.
No. 2 Book, 8½c, \$4.50 to \$4.75 in large quantities;

\$4.75 to \$5.50 in small quantities.

No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities;

\$4.40 to \$4.50 in small quantities.

Writings, 5c to 7½c.

Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons, \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.

Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less \$3.25.

B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.

No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.

No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.

Kraft, \$3.75 to \$5.00.

Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man., grey and red browns.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.

News quality, \$41 to \$42 per ton.

Bleached sulphite, \$54 to \$59 per ton.

Kraft pulp, \$3.60 to \$4.00.

Ground woods, No. 1, \$15 to \$16.

Ground wood, No. 2, \$22 to \$24, delivered United States.

New York Markets.

Office Pulp and Paper Magazine.

209 Broadway, New York.

The closing of one of the fairly large producing domestic sulphite mills has strengthened the market of that product to a considerable extent. There has been no advance in the prices, but they are now very firm under a rather brisk inquiry. A few new contracts have been closed in foreign pulp, but the general feeling is that paper mills are taking only as much pulp as is needed to fill orders that are on hand. Business in this market is fair, and the feeling is that all paper mills are now running nearly full. There is a growing activity in the spot nature of sulphate and kraft pulp. Importers are closing numerous deals in these grades at fairly good prices. Current quotations in kraft pulp are 1.80c to 2.00c for contract styles, while spot lots are being by mills at 1.90c to 2.05c. No new contracts have been reported closed in the interval. Deliveries are the problem of importers in all grades of foreign pulp at present, as there is a fair inquiry for shipments on the balances of outstanding contracts which are now drawing near their close.

Storage piles of mechanically ground wood pulp have been somewhat cut into during the interval, and paper mills have been asking for shipments on their contracts as well as coming in for spot lots at \$22.50 to \$25.00 a ton delivered. With the thaw now starting, grinding mills have a good supply of water and plenty of wood is being ground. The feeling here is that the current year will be a good one in mechanical pulp.

There has been a good improvement in the domestic rags market, although the volume of business done has not been up to the anticipations of dealers. The requests for prompt delivery of shipments on old con-

tracts is regarded favorably here, as it tends to prove that paper mills have cut down the surplus supplies that were found on hand at the end of the year. The low grades, especially roofing stock, have been in a little better demand, and prices, though low, are firm. The condition of the foreign rags market is practically without change. Importers, however, have abandoned the buyers' market, and are rather holding out for better prices under a slightly improved inquiry. The excess accumulations at mills are fairly well cut down and heavier importations are being made to satisfy the balances of outstanding contracts.

There has been a revival of the activity of the higher grades of old waste papers. Normal shipments are now being made at prevailing quotations in soft and hard white shavings at 2.00c. to 2.10c. a pound respectively. All grades of flat stock are in fair demand with current values ranging from 95c. to \$1.5 a hundred pounds for No. 1 and 70c. to 80c. a hundred for No. 2. There is a strong demand for and a brisk movement in old newspapers, especially overissues which are commanding 65c. to 70c. a hundred pounds. A falling off in the demand for old mixed papers is anticipated as one of the largest consumers is now out of the market. Current values ranging from 95c. to \$1.05 a hundred pounds for of business is being transacted, and in most cases at 40c.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.

Ground Wood, No. 2, \$17 to \$19, delivered.

Unbleached sulphite, dom., 1.90c to 2.20c delivered.

Unbleached sulphite, imptd, 1.75c. to 2c. ex dock, N.Y.

Bleached sulphite, domestic, 2.80c. to 3c delivered.

Bleached sulphite, imptd, 2.60c to 3.05c ex dock, N.Y.

Easy Bleaching, impt. 2.05c to 2.20c ex dock, N.Y.

Unbleached sulphate, imported, 1.75c to 2.10c per pound, ex-dock, New York.

Bleached sulphate, impt., 2.60c to 2.80c, ex dock, N.Y.

Kraft pulp, imported, 1.80c to 2.00c, ex dock, N.Y.

Soda pulp, domestic, 2.10c to 2.25c, delivered.

Paper.

Since the clearing of snow from the city business in general has shown a slight improvement. The trade at large is very hopeful, but at present shows the condition of the local market to be only fair. The general tone of all lines of business in New York is quiet. The failure and closing of two of the large department stores in this city has had some effect on the advertising pages of the daily newspapers, most of which have had to cut down the size from two to four pages less than they have been running. This has had a considerable effect both in the New York and Boston markets on account of the bankrupt concern's connections in the latter city. The consumption of newspaper in this city as a whole has fallen off about 2½ per cent for the first two months compared with the same period of last year. As a whole, the newsprint business for January and February showed a 5 per cent gain over the same period of last year. Most of this gain was in the Ohio Valley district, which is now in a state of boom. Consumption in that territory exceeds by 15 per cent the consumption of last year. Specialty papers cover and glazed grades, have been very active in demand, and prices are firm. There is an increasing volume of business going on in this line, and the outlook is for a good year. Wrapping papers and side run news are rather plentiful and business is quiet. There is a ready market for hangings and it is reported that several news mills have turned their machines to mak-

ing this grade. Book papers are in better demand and deliveries are difficult. Writings, bonds and ledgers are in fair demand at prevailing quotations. There is an increase in the inquiry for the medium grades. Tissues have been freely offered at 40c on car lots, and a fairly good number of orders have been closed. There is a little better demand for kraft paper, but prices are still very low and rather weak. Boards are in fair demand at prevailing quotations. Deliveries have been a little slow in the board business, but mills are now fairly well caught up. Toilet papers reflect a little better tone. Cigarette papers are in brisk inquiry and values are firmly maintained.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b. News, rolls, contract renewals, \$1.95 to \$2.00, f.o.b. News, sheet, \$2.25 to \$2.30 f.o.b. mill.

Book papers, car lots, C. & S. C., \$4.00 to \$4.50 f.o.b. Book papers, car lots, M.F.S., \$3.75 to \$3.90, f.o.b. Writing paper superfine, 13½¢ to 17¢, del. east of Miss. River.

Writing paper, extra fine, 11¢, del. east of the Miss. River.

Writing paper, No. 1, fine, 9¢, del. east of the Miss. River.

Writing paper, No. 2, fine, 8¢, del. east of the Miss. River.

Writing paper, engine sized, 4½¢ to 8¢, del. east of the Miss. River.

Bond paper, 5¢ to 24¢, delivered east of Mississippi River.

Ledger paper, 8¢ to 30¢, delivered east of Mississippi River.

Linen paper, 7¢ to 1c8, delivered east of Mississippi River.

Manila jute, 4¾¢ to 5¼¢, delivered.

Manila, wood, \$2.40 to \$3.00, delivered.

Kraft, No. 1, \$3.50 to \$3.75, f.o.b., mill.

Kraft, No. 2, \$3.25 to \$3.50, f.o.b., mill.

Boxboards, news, \$30 to \$33 per ton, delivered.

Boxboards, chip, \$28 to \$31 per ton, delivered.

Boxboards, straw, \$28 to \$31 per ton, delivered.

Wood pulp board, \$42.50 to \$45 per ton, delivered.

Tissue, white, cylinder, 40¢ to 42½¢, delivered.

Tissue, fourdrinier, 47½¢ to 50¢, delivered.

Tissue, jute Manila, 40¢ to 42½¢, delivered.

and as soon as they become a little more brisk, and the present stringency in money removed, we may anticipate a turn for the best. There is a dull feeling over all the continental and English markets, and no doubt the sudden change from last year's trade and the quietness of the political world, has caused these centres to become moribund.

The market for sulphite and sulphate is remarkably quiet. The quietness, at the time of writing, is followed by an unusual amount of quietness on the part of the British importers, who are not disposed to talk of business matters so readily, as if things were humming a little better. That "peaceful" state we are in shows our position in the wood pulp world, and shows what way the wind is blowing. Beyond this one cannot go, and so many stories arrive daily from Scandinavia as to what America is doing, and not doing, it forces one to the conclusion that the States must be keeping the Continent and Scandinavia pretty busy with enquiries as certainly the shipments to American ports are very light. Of course, buyers on this side and on the Continent covered themselves pretty well for next year, when quotations were easier for sulphite. That action, no doubt is helping to-day's dullness. Good qualities of sulphate have also been purchased in 1913 for years ahead. But sulphite and sulphate prices are now very firm, and it is reported that Scandinavian stocks are not so very large. Since last report the changes in prices are practically infinitesimal.

The tendency in pulp contracts on the part of all Britishers is to have a long contract and this has already been reported to Canadians, who should keep a strict eye out for a share of what is going—agents can help. Therefore, mechanical contracts are large to-day, and the demand for prompt is about the usual average. Buyers are always on the alert for a reduced quotation, but generally speaking, sellers are very firm. Pine 50 per cent moist, is quoted at about \$9.70 to \$10.70 c.i.f. London, and English ports for unwrapped prompt, whilst forward goes 60 cents to \$1.50 extra; dry for prompt is \$20.20 to \$21.50, and forward \$1.00 extra. Dullness prevails now in the market and the same reports reach London in regard to Scandinavia.

Esparto continues strong, and prices are remaining on the same high level. These high prices are being paid for all moderately early shipments, and the margin of profit on Esparto papers is consequently very limited.

Rags are in fair demand, and prices are inclined to be easier for most grades. China Clay continues enjoying the busy demand at moderately high prices, whilst contracts for other fillings like mineral white and gypsum, barytes, etc., are all closed for this year, and prompt orders are accepted at high prices. Sizing is inclined to be easier in quotations, while Rosin is going through a dull and cheap period.

SWEDISH MARKETS.

The pulp market at the present moment may be characterized thus

Mechanical Wood Pulp inactive and depressed, Sulphite Cellulose quiet, Sulphate Cellulose, first class brands of Easy Bleaching quality in strong demand with an advancing tendency, other qualities quiet.

In general the pulp markets are adversely affected by the continuation of the depression in the paper trade which does not yet show any signs of passing away.

The British Markets.

(Special to Pulp & Paper Magazine.)

London, March 21, 1914

A small moderate amount of business of a new character, a small margin of profit and signs of reduced dividends, about fairly and accurately gauges the position and the state that the British paper industry has taken up to recently. Everyone seems to be crying out for more work, and those who have a little to get on with keep grinding daily. Mills with orders booked up for some time prior to the close of 1913 are in the highest production today, but new business, it is said, does not really require to push things on in the wood pulp trade and the mechanical manufactories. There is a fair amount of orders pending in newsprint and fine writing, with packing and wrapping papers are in somewhat demand. Sulphite classes of papers are closed to regular further orders for some time.

The general opinion prevails here that by the end of March or early next a serious improvement in printing sheet and publishing business are working on short time

ONTARIO WILL SUSPEND RESTRICTIONS ON PULP WOOD FOR ONE YEAR.

The Province of Ontario is to allow the exportation of pulp wood cut from Crown lands. The decision of the Government to take this step is due to representations made by the limit holders, who suffered great losses in the storms of last November, when millions of feet of spruce timber was uprooted. Most of this timber is fit only for pulp wood. The Ontario paper and pulp mills are already overstocked with pulp wood, and the only market for it is the United States paper and pulp mills of New York and Pennsylvania. The bill suspends the prohibition of export for one year.

The Imperial Forestry Bureau of Japan has recently been encouraging the growth of camphor trees in order to bring the production of raw material up to the demand for it. Under the direction of the Forestry Bureau each prefectural government in Kyushu has been cultivating model camphor forests, and private individuals have greatly increased the number of trees on their estates. The number of camphor trees in Kyushu is over 500,000, while the area devoted to their cultivation is more than 60,000 acres. Up to the present time all refined camphor has been made at the sacrifice of the tree, but recent experiments, using only the leaves and twigs, have been remarkably successful. As a result the trees will no longer be felled, and as they grow larger the value of camphor forests will increase year by year.

WOOD STEAMING.

Dr. Heuser reported to the Verein der Zellstoff und Papier-Chemiker, at the Berlin meeting last December, the results of his attempts to utilise the waste lyes resulting from this process. The wood was steamed for eight hours under a pressure of four atmospheres, and a sample was tested every half hour. The substances estimated in each batch of lye were organic acids, sugars, rosins, inorganic salts, incrusting bodies, tannins, and furfural. The rosins, inorganic salts, incrusting bodies, schenecklyna, and tannins leave the wood without chemical change, but the sugars, furfural, and

acetic and formic acids, owe their production to the action of the steam. The brown colour caused by steaming is to be regarded as an incipient charring.

The production of organic acids is at its maximum after four to six hours' steaming. 100 kg. of wood yielded 213 grammes of acetic and 32 grammes of formic acid, on the average. Fir gave the most formic acid. The greatest yield of dextrose was also with fir, and the maximum yield was reached in from two to five hours with pine, and from four to six hours with fir. The largest yield obtained was one-half per cent. of the weight of the wood. Rosins were not obtained in quantities which would make their recovery remunerative. The furfural was also negligible.

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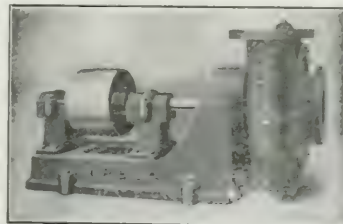
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VOL. XII.

MONTREAL, APRIL 15, 1914

No. 8

A Safeguard to Employers

The manufacturers of Ontario have made another vigorous protest against the terms of the draft Compensation Act submitted to the Ontario House. In secret session at Toronto a few days ago a large body of manufacturers debated the points at issue, and drew up a resolution, reached after long debate and discussion, which is to be presented to the Ontario Government in an effort to influence them toward making the act a piece of legislation equitable to both the employer and employee alike.

In order to reach any definite decision on the draft act as presented by the Commission, it is necessary to give the whole schedule most careful study. This most people have not the time to do, so that they are forced to rely on the findings of others more familiar with the acts in force in other countries, who have given the present schedules careful consideration. The members of the Canadian Manufacturers Association have done this with the result that a careful and composed summary has been presented to each, by which it is made plain that many provisions of the proposed act would place an unnecessary and much too heavy burden on the manufacturers, and serve to bring about a condition not conducive to the best interests of either the workmen or the employers.

It must not be inferred, however, that the manufacturers and employers are seeking to evade the law or cause to be enacted an act that would not be to the best interests of the whole community. In the first place, it was the pressure that was brought to bear by the Canadian Manufacturers' Association that influenced the present government to appoint a Committee to investigate the systems in force in other countries

and draft a compensation act suitable to conditions in that Province. The manufacturers are anxious to have an act more just than any now in force, better than that in force in either England, Germany or the State of Washington, all of which are held as leading examples. Again it is to the interests of the manufacturer and employer to have such means of settling disputes that arise from injury to workmen in their employ. Such an act would relieve them of many undesirable complications that sometimes arise under present conditions. It would provide a means for settling compensation according to a fixed rule and would thereby prove a saving. At present employers very often take on unnecessary and unexpected burdens in order to do what they think best by the injured workmen, which in many cases amounts to a great deal more than would be obtained under law. The manufacturers are anxious for a compensation act, and have done all in their power to assist the Commission in drawing up a draft bill.

The draft bill presented undoubtedly places an unjust burden on employers, and if passed as it stands at present will not work to the best interests of the employee, as is anticipated. It would mean that rigid examination of all workmen and applicants for positions would ensue and unfair restrictions would be made. Besides, the burden placed on the employer, especially the small employer, would be so large as to unnecessarily raise the over-head expenses of his shop, thus placing him in an unfair position with his competitors from other provinces. It would mean the wrecking of many a small, struggling industry, which, if given encouragement, would in a few years be a great factor in the industrial life of the province.

Ontario cannot afford to place undue burdens on her

manufacturers, and the labor classes should realize that fact. Employers are just as keen for a compensation as the workmen are just as anxious to see it made equitable, so that it is to be hoped that the resolution of the manufacturers will be given careful consideration by those responsible for the passing of the Bill through the Legislature.

The Glare from Paper

A practical study of glare from paper in its quantitative aspects is outlined in this issue by Prof. L. R. Ingersoll, who has made use of the familiar principle that paper, in common with most other substances, polarizes that portion of the light which is specularly reflected from it. With most surfaces polarization is fairly complete at a certain critical angle. The proportion of polarized light reflected at this or any other angle can readily be determined by the use of some one of the forms of polarimeter, a convenient and ingenious type of which Professor Ingersoll describes. Such an instrument provides a rather handier way of investigating the specular reflection from paper than is found in the ordinary photometric processes for determining this quantity, and we hope that it will be freely used in practice to obtain data for the improvement of printing papers.

The tables of results reported by Professor Ingersoll are very striking particularly in showing the great difficulty of avoiding specular reflection and the effect of calendering on the amount of the surface reflection. As Professor Ingersoll shows, the varying texture of the paper produces astonishing variations in the amount of glare, the coated book papers being particularly high in specular reflection. Colored papers have almost as much surface gloss as uncolored ones so that the proportion of specularly reflected light, on the whole, is large in them. Some little experimenting will undoubtedly be necessary in order to determine from the measured percentage of specular reflection by this or any other process the working qualities of the paper as viewed by the printer. It seems now to be fairly well understood that even halftone cuts can be used successfully on paper with a much less glossy surface than was once supposed to be necessary, even without particular attention to the character of the blocks. When the photo-engraver understands better how to make cuts for printing on unglazed paper the probability is that results of a very high class can be obtained without any particular difficulty, except perhaps in the case of some reproductions with intricate detail for which plate paper may still have to be used to secure the best results. However, the gain from the reduction of glare from paper is so marked in its relation to comfort in reading that printers would make a serious effort to utilize the facts connected with paper.

The Tariff Announcements

The recent budget speech of Finance Minister the Hon. W. T. White, was awaited with great interest by both the industrial and agricultural interests throughout the country. During the last few months influential deputations have waited on the government representing the milling, iron and steel, and agricultural interests, urging upon them necessities of one kind or another, so that the policy of the government, as was to be laid down in the budget speech, was awaited with considerable apprehension. In dealing with the tariff, Mr. White declared that the government adhered to the policy of moderate protection to Canadian industries, including the great basic industry, agriculture. This, he added, was the best policy for Canada, the policy under which it had prospered in the past, and could expect to prosper in the future.

There is no doubt that, situated as Canada is, protection in reasonable degree is helpful to industry, to those who depend on manufacturing enterprises for their means of livelihood, and to the communities which develop wherever a successful productive business is established and maintained. There is considerable objection here in Canada to that policy, but it must be upheld. The duties and changes suggested are reasonable, and good results should follow.

The Freight Rate Judgment

Judgment in the long drawn out western freight rates inquiry by the Railway Commission was handed down last week, making substantial reductions in western standard maximum rates, special distributing tariffs, through rates from east to west, local and west-bound rates on grain and flour, coal rates in Alberta, special mileage rates on butter, cheese, eggs, dressed meats and dressed poultry, between prairie points; special mileage tariffs on vegetables in Saskatchewan and Alberta, and cement rates and rates on fence posts, fire-wood, brick, stone, gravel and sand in those provinces; as well as the rate on pig iron between Port Arthur and Winnipeg. These reductions averaged from 5 to 30 per cent, but the judgment left untouched, because of their reasonableness, the through grain rates and through rates on nearly all products west-bound, rates on live stock, the special rates on fruits and vegetables from British Columbia, cement rates out of Winnipeg, sugar rates from Vancouver, rates on smelter products from the British Columbia mines and local passenger rates in British Columbia, all of which were an issue in the case.

The judgment does not reduce rates on paper. Although substantial reductions have been made in all class rates west of Fort William, and Port Arthur, no reduction has been made in the commodity rates on

paper under which the traffic moves. These, with other commodity rates were allowed to remain untouched, to be taken up later and dealt with on their merits in case of complaint.

The Finance Minister's Optimism

Canadians will take heart from the encouraging words uttered by the Hon. W. T. White, Minister of Finance, who delivered his annual budget speech early this week. In a year of world wide stringency in money matters, he was able to show a revenue of \$163,000,000 and ordinary expenditures of \$126,500,000, leaving a balance of \$36,500,000. Probably the matter of most interest discussed by Mr. White was that relating to the financial stringency.

From this time forward, until the culmination of the next economic cycle, we are on the economic experience of the past, justified in looking for much more normal monetary conditions. Bankers and business men unite in the opinion that while, it is a time for prudence and caution, it is also a time for confidence and courage. The strength of Canada lies in her vast natural resources. That is the rock upon which our prosperity is soundly based and founded. Any depression, generally speaking, can be but temporary in character, until such time as normal money conditions, joined with business confidence, again restores the wonted activity of the nation.

Imports of Paper into United States

An interesting bulletin was sent out the latter part of last week by the department of Commerce showing the imports of paper in the foreign trade of the United States and foreign countries. The bulletin says:

Imports of paper for use in the printing of news papers and books aggregated 237 million pounds in the first five months under the present tariff law which transferred to the free list printing papers valued at less than 2½ cents per pound and reduced from an average ad valorem equivalent of about 15 per cent. under the old law to 12 per cent. the duty assessed on printing papers of a higher valuation. This total of 237 million pounds is double that for the corresponding period a year ago, a fact of interest in view of the tendency toward lower prices for newspapers, magazines, and other vehicles of popular information. At the present rate of importation the total imports of printing paper in the fiscal year ending June 30 next will approximate 535 million pounds, compared with 120 million in 1912.

The aggregate value of imports of articles connected with the paper industry, including, in addition to paper and paper products, pulp wood, wood pulp, and other

paper stock, was \$55,000,000 in the calendar year 1913. On the other hand, while the annual domestic production of paper and manufactures thereof had risen above \$300,000,000 as far back as 1909, the exports in that line during recent years have never exceeded \$25,000,000.

The foregoing facts epitomize statistics compiled by the Bureau of Foreign and Domestic Commerce of the Department of Commerce in connection with studies of our paper trade in its relation to the world's paper industry, regarding which comprehensive reports on production of materials, market requirements, etc., have been received by that bureau from consular officers abroad and are now being sent to the leading centres of the domestic paper industry for examination by those directly interested.

The importance of paper as a factor in international trade grows with the advance of civilization and general intelligence, ten leading countries enumerated below alone showing a total exportation of nearly 250 million dollars' worth of paper, books, maps, etc., or twice as much as ten years ago. In this trade Germany leads, her exports of paper in various forms having increased from 58 million dollars in 1908 to 76 million in 1913. In the same period those of Netherlands rose from 28 to 36 million dollars; France, from 16 to 32 million; the United Kingdom, from 23 to 34 million; and the United States, from 13½ to 21 million, while those of Sweden increased from 7¼ to 9 million; Belgium, from 7¾ to 12; Austria-Hungary, from 12 to 13; Canada, from 4 to 7; and Norway, from 5 to 6 million dollars.

World-wide opportunities exist for the sale of paper, for in every part of the civilized globe paper in various forms it is an article of necessity. The United Kingdom is the largest single market, having imported last year \$40,000,000 worth, compared with \$24,000,000 worth imported by the United States, \$18,000,000 by France, \$16,000,000 by Canada, \$16,000,000 by Russia, \$12,000,000 by Germany, \$9,500,000 by Argentina, \$8,000,000 by Belgium, \$6,000,000 by Brazil, \$4,000,000 by Japan, and \$3,000,000 by Chile, while Greece, Sweden, China, and Bulgaria, each importing about \$1,000,000 worth annually, and many other countries with smaller imports are nevertheless important as actual or potential markets for paper products.

Sales of American-made paper goods, while relatively small, are widely distributed. In the calendar year 1913 we sold 115 million pounds of printing paper in foreign countries, chiefly Australia and Argentina; and 10 million dollars' worth of books, music, maps, etc., one-half of it going to Canada and a considerable amount to other English speaking communities. The South American republics, Cuba, Mexico, Germany and German colonies, France, China, Japan, may be mentioned among the numerous other countries to which our books and other printed matter were exported last year. These figures, however, do not include the vast volume of American trade literature, catalogues, etc., now going abroad. Our carbon paper was exported last year to the value of \$400,000 for use in New Zealand, India, South Africa, and other countries. American-made wall paper is sold not only in Canada, but in less quantities in Portuguese, Africa and Australia. Our playing cards are exported chiefly to England, India, Hongkong and Canada, and in increasing quantities to Argentina, South Africa and scores of other countries. The \$1,000,000 worth of American-made writing paper and envelopes exported last year included sales to all parts of the globe.

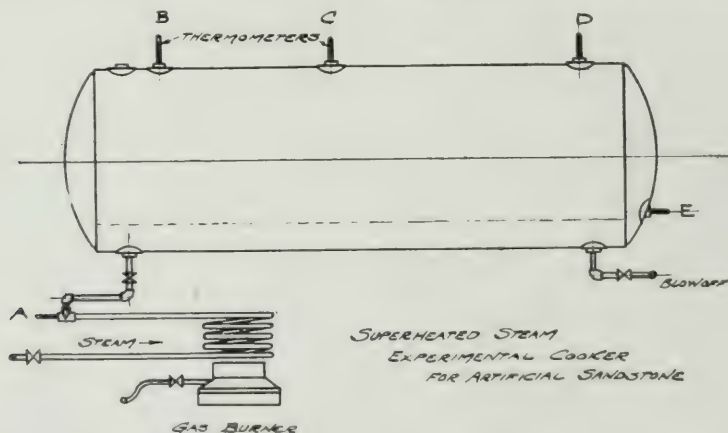
SUPERHEATED STEAM AND PAPER DRYING

By JOHN W. BRASSINGTON.

The fact that the application of superheated steam to drying problems is often discussed, and like *Banquo's Ghost*, will not down, make it a duty incumbent on those who have actually tried the efficacy of the application to make public their experience with it. There is something about certain engineering operations, noticeably "fuel burning," "steam generation" and "drying operations" that neophytic engineers seem to find irresistible, so even as a moth flies to the light, so they try their prentice hands at such engineering problems, until burned and wiser, they charge up their hurts to experience. Unfortunately there are always amongst these experimenters some who will not see the fallacy of their theories, either because they are hypnotized by the fact that the device is their own design, or because they dishonestly crave their "thirty pieces of silver." It is, therefore, doubly necessary that the truth when known should be told by each searcher for the real facts, as far as his own experience will enable him to do so, if only to confound those who are either unable or unwilling to furnish an unvarnished tale.

The experience of the yard was that the higher the pressure, and therefore the higher the temperature, the shorter was the time required to cook; hence everyone believed that by using superheated steam we would not only cheapen the construction of the cookers, but that we would vastly increase the output of the plant, using the same apparatus and the same amount of labor.

In order to try out the possibility of the scheme, we had a miniature cooker made, and we used superheated steam in it during a series of experiments for two or three weeks, using all degrees of superheat. Those amongst us who were engineers, soon realised even at the beginning of the first experiment, that superheat is not applicable to an economical or to a uniform system of drying, because there is no conduction and no convection of heat in a gas like superheated steam. Superheated steam is a poor conductor of heat and has not automatic convection qualities like water for instance, that, although a poor conductor of heat, yet transfers and diffuses heat in its body by means of the motion of the particles of the mass, a pro-



About five years ago, the writer was called upon in the capacity of Consulting Engineer, to consider the advisability of using superheated steam in the cookers at a stone yard making artificial limestone and limestone bricks. The bricks or stones, when made and moulded to form, were placed in closed steel cylinders and cooked at a temperature of from 350 deg. to 365 deg. F. for several hours; this temperature was maintained by filling the steel cookers with saturated steam at a gauge pressure of from 125 lbs. to 150 lbs. This gauge pressure, of course, called for the use of very heavy and expensive cookers, as well as necessitating the employment of high-class labor. It was, naturally, a most tempting possibility to consider, when it was proposed to be the same work with steam at only 10 lbs. pressure, equivalent of from its equivalent saturated temperature of 224 deg. F. up to any temperature that could be found desirable, in order to get the best results.

cess technically called convection.

Referring to the figure showing our experimental cooker, we would have, for instance, 700 deg. F., reading at thermometer A, and 220 deg. F. at B, C, D and E, nor could we get any higher readings until we opened the blow-off valve, and then we would have readings of say 650 deg. F. at B and C, with 220 deg. F. at D and 650 deg. F. at E. The possibility of thermometer error was obviated by repeatedly transposing all the thermometers, practically the same readings being obtained.

It was the desire of the experimenters to ascertain whether it was possible by forced circulation, to use superheated steam by either using a fan or by blowing off as economically as possible, both these methods failed because of the inertness of the superheated steam and its small heat-carrying capacity. The specific heat of superheated steam is much lower than that of saturated steam, and while the temperature is

high the quantity of heat is small; it is, so to speak, like trying to warm your hands on a frosty day with a lighted match; it is hot enough to burn, but there is not enough heat to do the work required of it. The lack of conductivity of heat of superheated steam makes it impossible to supply heat for the purpose required, to replace that taken away from the heat supplying medium by the process in question.

Now let us suppose it is our purpose to use superheated steam in the dryers of a paper machine, and with this object in view we should introduce it through the steam joint of a dryer, at a temperature of say 300 deg. F. and at 10 lbs. pressure, that is, with about 40 deg. F. of superheat; it would probably be considered impracticable to use steam of a much higher temperature. This superheat, however, be it high or low in temperature, can never reach the other side of the dryer, because all of it that is not spent and wasted in heating the head of the dryer on the driving or entry side, to a higher temperature than the rest of the dryer, must be obliterated by the water of condensation. This condensate covers the inner walls of the dryer, held to them by the centrifugal force due to the revolutions of the dryer; and superheated steam cannot remain superheated when in contact with water.

The use of superheated steam in a paper machine can only result in a local heating of one end of the dryer, and so to a consequent spoiling of the paper; there are other troubles, however, that accompany an effort to use superheated steam in a drying operation; it will for instance, infallibly destroy the reliability of any temperature control device, because of its own insecure hold on its own temperature, a sprinkle of condensation on the incoming superheated steam, surely not an inconceivable thing to happen inside a paper dryer in use, may destroy 40 deg. or 50 deg. of superheat almost instantaneously, then what may become of a thermostat control if it happens to be in the dryer?

As the supply of superheated steam must from the nature of things be at a fairly constant temperature, and because of its low specific heat, that same supply must also be in a condition of unstable heat balance (if we may coin a new engineering phrase) therefore, irrespective of all other objections, the use of superheated steam in the dryers of a paper machine must add greatly to the importance of the now practically unknown factors that control the equitable distribution of the steam in the main header. A writer in the "Papier-Fabrikant" states:—"In a dry part consisting of seven top and six bottom cylinders, I had the following trouble: A great many fibres stick to the first drying cylinders above and below, and the cylinders in question looked as if they had been painted with white lead. In 'look-through', the paper looked quite perturbed; the more size I added the more the ductors had to do, and the worse did the 'look-through' become. At last I hit upon the following idea. I inserted in each flange, a sheet metal disc whose central opening was 3mm, and my troubles were over with."

Too much heat or steam in the first few dryers is apparently not a good thing for a heavily loaded paper; it is better perhaps to supply the steam header with steam at a point somewhere between the calendars and the presses, preferably nearer the presses, and then arrange for the control of the distribution of the steam by an additional valve in each run of pipe. If, however, you are handling superheated steam and on Monday morning there is much water in some dryers and none in others, then there will be inversely low heat in some dryers and high heat in others, though the high heat will be at one end only of the other dryers;

it follows then, that the steam distribution control would vary from that required after a few hours' run. An unequal localisation or distribution of heat, such as much obtain with the use of superheat in a nest of paper dryers must prove harmful, if not fatal, to the successful operation of the machine.

In conclusion, let us consider the actual physical conditions that would exist could superheated steam be used, and compare them with the actual physical conditions that exist when saturated steam is the heat carrying medium. Let us take a dryer 48 in. in diameter, 120 in. face, and fill it with saturated steam at 5 lbs. gauge pressure and maintain that pressure with a constant supply. At any given moment this dryer will contain approximately 125 cubic feet or 6½ lbs. of steam carrying for delivery to the paper that is to be dried, 7,200 B.T.U., the temperature of the steam being 228 deg. F. Then the transference of heat is proportioned to 228 deg. — 212 deg. = 16, giving a flow of heat through the shell of dryer that is uniform and constant. Now let us suppose an impossible thing, i.e., that the dryer is full of steam at 5 lbs. gauge pressure, uniformly superheated all through the contents of the dryer; let this degree of superheat be 150 deg., giving a total temperature of 378 deg. F. Then the dryer contains as before 125 cubic feet of steam, but it only weighs 5 lbs., and in spite of its high temperature, it only contains 6,200 B.T.U. as available heat, ready for transference to the paper that is to be dried. The transference of heat for the first second of time—now we have assumed we have filled our dryer with this superheated steam, by defying the laws of nature) is proportional to 378—212=166 that is, it is over ten times as great as when the steam was only saturated steam. Now, let us assume what is nearly correct, that 1 B.T.U. per square foot of surface are transferred per degree difference of temperature per minute; the paper covers about 80 square feet of the dryer, so in the case of the saturated steam, 4,480 B.T.U. are lost by the steam in the first minute, so if we have a 2 in. steam pipe the flow of the make up steam must be equal to 4480 : 125 :: 7200 : 0.23 = 3800 feet per minute.

In the case of the superheated steam, if we suppose the initial transference of heat to be sustained for a period of one minute, we have an equivalent figure to the one given above for transference of heat in the first minute of 50,000 B.T.U., instead of 4480 B.T.U. This evidently means a speed of steam of 38,000 feet a minute through a 2 in. pipe, or else the use of a pipe of sufficient area to give say 6,000 feet per minute steam speed, that is a 7 in. pipe supplying one dryer.

As a matter of fact, it is impossible to transfer heat by means of superheated steam by any means except the mechanical movement of the steam, by, for instance, brushing away and discharging all steam as waste to the atmosphere as soon as its superheat is given up, and then replacing it by a like quantity to be in its turn wasted; such a procedure is, of course, absurd, as all the latent heat, or about 90 per cent of the total heat, would then be wasted; the figures given in the preceding paragraph are given to illustrate the fact that should it be decided to use superheat anyhow, in spite of the enormous heat loss involved, that after we had made full arrangements to maintain a sufficient flow of steam to do our work in a small dryer 48 in. in diameter and 120 in. face, we would require a 7 in. pipe to keep our dryer full of enough steam; this would mean a main heater (supplying the nest) if we put our steam in about midway, so as to supply the two branches equally, of 27 in. diameter, fed by a 39 in. diameter inlet.

The arguments given in this article are based on a dispassionate statement of the writer's as described in the beginning of this writing. It must be evident to the reader that as he reads, there is an effort possibly at special pleading and a desire to destroy all the hopes of our superheating friends; the writer acknowledges this frankly, but this effort is aimed only at such nefarious charlatans that infest the engineering "profession," and use their engineering knowledge for the purpose of swindling better men out of their hard-earned cash. It is not the intention of the writer to browbeat or confound, but rather to help the honest investigator, and it is hoped that any such will rigidly criticize this article and sternly call the writer to account for anything therein that is inaccurate and misleading, for it is his ardent desire to be so corrected, whenever found to be in error.

Ottawa Notes

TARIFF CHANGES SLIGHT.

Ottawa, Ont., April 10.—The long expected tariff announcement of the Minister of Finance, Hon. W. T. White, was made in Parliament last week. It saw only two changes affecting the paper industry, and those minor ones. The tariff, however, does not appear to please the paper trade, its sins being rather of omission than commission, according to one typical view expressed by Mr. W. H. Rowley, president of the E. B. Eddy Company.

One change made by the new tariff is in connection with decalcomania paper, which instead of being left in the unenumerated list and therefore dutiable, is made free. Twine or yarn of paper when imported to be used in the manufacture of furniture, which was formerly dutiable under a general tariff of 20 per cent is also made free.

Of the tariff, Mr. Rowley declared that while in many respects the revisions were wise there were two points on which he did not agree with the proposals. In the first place he considered the farmers in Canada had already got too much, and were going to get still more under the revisions. In the second place, he believed the changes would bear too heavily on this industry. "I think the tariff will bear pretty heavily on this industry," he said. "I would have liked to have seen some changes there." But Mr. Rowley would not say just where the weight would come or what changes he would have liked. His position, he stated, made it rather difficult for him to make a statement on the matter. On another point he would have liked the Government to have gone further, in the matter of duties on bituminous coal, which enters into the manufacture of paper as in that of many other commodities. He would have preferred a free interchange of this commodity in the way of an agreement to make coal free.

The Western Freight Rate Judgment.

Another announcement of vital interest to the Canadian paper trade is the publication of the judgment of the Railway Commission in the Western Freight Rates Inquiry. This case, which has been under consideration in one form or another since 1904 is said to have had its origin in an agitation started by some leading papers which considered they were paying too high rates on their newsprint. The judgment, however, does not reduce rates on paper, according to what was expected by some newspapermen from an official of the Railway Commission.

It is a sad and not untypical and costly paper normally runs under the same conditions as regards railway freight. A considerable reduction has been made

in all class rates west of Fort William and Port Arthur it would therefore appear that lower rates would be paid on paper. As a matter of fact, however, the traffic has really moved under what are known as the commodity rates on paper since these are lower than the ordinary fifth class rates. They are also somewhat lower than the 5th class rates even with the reductions which have been ordered. No reduction has been made in these commodity rates on paper, these with other be taken up later, and dealt with on their merits in be taken up late and dealt with on their merits in case of complaint.

During the hearing a series of rates on paper was presented by counsel for the different provinces which were asking for lower rates, to show that these were higher than were being paid by American shippers in the Western States. Despite this, however, the Railway Board has not ordered any relief to Canadian shippers of paper. The rates on lumber are also left untouched, but these were reduced by a previous order, and are now considered low enough.

Celebrates 87th Birthday.

Mr. John R. Booth, the grand old man of the lumber and paper trades, and head of the J. R. Booth firm, last week celebrated his 87th birthday. Mr. Booth has now in great part recovered from the injury he sustained some months ago, when he was struck by a falling timber and laid up for a time. He still has to use crutches, but is able to visit his plant and direct the work there as usual in spite of his advanced years.

Sir Wilfrid's Prediction.

That within the lifetime of the younger members of the House of Commons the greater portion of paper manufactured on the American continent would be manufactured along the line of the Grand Trunk Pacific Railway was the interesting prediction made by Sir Wilfrid Laurier, leader of the Opposition in Parliament, during the debate on the National Transcontinental Railway a week ago.

"We know that there are immense rivers flowing from the mountains towards Hudson Bay with immense capacities of water power development," said Sir Wilfrid. "We know, further, that the resources in pulpwood are incalculable and that if the Governments of Quebec and Ontario are wise and understand how to husband their wealth, these resources will be inexhaustible for all time. It is not a rash prediction to say at this moment that within the life of men sitting in this chamber, the greater proportion of the paper manufactured on the continent of America will be manufactured along that line of railway."

The Georgian Bay Canal Inquiry.

One of the duties of the newly appointed Georgian Bay Canal Commission, which entered on its offices a week ago, will be to "inquire into the pulp industry, and the possibility of development along the line of the waterway," to quote one clause in the Order in Council creating the commission. The commission consists of two Montreal members, Col. F. S. Meighen and Edouard Gohier, and a Winnipeg man, Mr. Sanford Evans, as chairman. It will take up the question of the commercial feasibility of the canal and, in this connection will look into the matter of waterpower development as well as the pulp resources of the district through which the waterway will pass — which have long been known as very extensive, and a variety of other questions. It is predicted that with the construction of this canal and the operation of the National Transcontinental, the center of paper production in Canada will shift considerably farther west than fixed at present.

BLUES FOR LEDGER STOCK

By Harry A. Maddox.

The colour of paper made for loose-leaf ledger and account book work is a factor of more than ordinary importance. The higher grades of paper are required to maintain a good all-round condition for very many years. It avails little that the material is carefully selected and treated if the colour fades and gives place to a dirty yellow appearance. Yet this is precisely what is happening in the case of the greater proportion of ledger paper now turned out. The introduction of cheap mineral colours and the popularity of organic dyes have considerably reduced the prospects of permanence in the lower grades of machine-made stock. The finest type of azure colouring or blueing now performed is that executed on No. 1 grade English hand-made ledger paper. The colouring matter used in this stock is the same that has been used since ledger paper came into being, namely, smalts.

The principal blues used on medium and high quality stock are smalts and ultramarine, although latterly indanthrene has come largely to the front, principally in the United States. The latter dyestuff has not yet come into vogue in England, but there is little doubt that when its properties become thoroughly appreciated it will find its way into many middle-grade machine papers.

The very best ledger papers in England are still coloured with smalts of a very fine quality. The next grade employs a secondary class of smalts or a mixture of smalts and ultramarine. If the price will not stand smalts, pure ultramarine is resorted to, and in any case if a bright, clear hue is desirable, ultramarine is preferred as giving the best results. This mineral blue has several advantages over smalts, other than in the matter of price. For one thing, it mixes well and with ordinary care does not speckle the paper; again, it yields an incomparable shade of blue, of an opalescent character and very little dye is lost in the backwater. For permanence and fastness against the influence of outside and foreign reagents ultramarine cannot compare with smalts. The price of smalts, however, debars it from entrance into any but the best and more expensive sorts of ledger paper.

In order to appreciate the properties and characteristics of each type of colouring material, it is advisable to devote space to a more extended consideration.

Smalts is a mineral blue pigment possessing a rather low colouring power. It is produced from cobalt glass, ground and pulverized to an exceedingly finely divided state. Chemically it is regarded as a mixture of potassium and cobalt silicates. The actual composition varies considerably according to the grade of colour. The extent of the variance has been stated as: Silica, 56 to 70%, potash, 12 to 22% and cobalt, 6 to 16%.

The dyestuff is absolutely fast to light, air, fumes, gases, acids or alkalis. Age does not impair the purity of the shade in any degree, hence the colour of a smalts dyed ledger paper from first quality linen material is about the fastest thing known in tinted stock. The blue of smalts is rather a subdued tone compared against ultramarine. The presence of the pigment in any paper may be detected by the prevalence of minute specks on the under side. It is not safe, however, to place too much reliance upon mere appearance, for some of the duller shades of ultramarine make a good imitation of smalts, in addition to which there is a prob-

ability of specks occurring. If it is necessary to definitely decide which of the two colouring matters has been used in a paper an incineration and test of ash must be made, for it is very possible that a mixture of smalts and ultramarine may have been used.

Specks are a chief source of trouble and difficulty with all mineral pigments. If they find their way in large quantity into high grade pulp the market value of the ultimate paper is apt to go down considerably. In the case of smalts, the travel over the sand table abstracts large numbers of the pigmentary particles and helps to bring others to the bottom of the pulp by virtue of their high specific gravity. On reaching the wire and suction rolls and boxes the downward pull of the latter, plus the native tendency of the heavy mineral, combine to bring the colour and specks to the underside of the paper. To counteract this to a great extent an improved mixer may be used. It is very essential that the most finely divided smalts be selected and strained through fine mesh cloth after thoroughly dissolving, also that the pulp be kept on the thick side as much as convenient. Otherwise the colouring stuff will run through very speedily with the fall of the water. The shake needs to be regulated to a firm and not too rapid action so that the particles may remain in suspension.

Ultramarine is described as a double silicate of sodium and aluminium together with bisulphide of sodium. It is a colouring matter that runs in several grades, varying in composition, quality and shade, the latter varying from an almost violet hue to greenish blue. In the mill, it becomes essential to control the colour and power of the various consignments of mineral received, by mixing to a paste with known proportions of china clay and glue and comparing against a set standard.

The real original ultramarine (not used in paper-making) was prepared from a rare and costly type of stone, the lapis-lazuli. Ancient Egyptian monuments bearing paintings over 4,000 years old still exhibit these blue pigments in all its original brilliance. Commercial ultramarine is prepared by fusing together silica, alumina, soda and sulphur, the last ingredient being the most dangerous as an impurity in the ultimate colour, hence most carefully controlled in the case of the highest grades. If traces of sulphur or injurious sulphides are at any time suspected in the pigment, as it arrives at the mill, a very simple but efficient test determines the presence thereof. Make up a paste of the blue with distilled water and apply to a clean copper plate. Allow the mixture to stand for about 24 hours. If there is sulphur residue in the ultramarine the plate will show signs of blackening, due to the formation of copper sulphide.

Ultramarine is very fast to light and alkalis, but is vigorously attacked and bleached by mineral acids, hydrogen sulphide being evolved during the process. The effect of nitric acid upon ledger paper may therefore be used as a test for the colouring matter. It does not need the direct application of acid to destroy the colour effect of ultramarine, acid fumes for instance, have a deleterious effect. Coal and gas burning results in the formation of gases in the air which also attack the tint of ledger stock in measure according to the amount and nature of the said gases in the atmosphere.

Principal, coal and gas burning results in the evolution of carbonic and sulphurous (afterward transformed to sulphuric) acids. It is particularly noticeable on cheap and account books that the edges of the leaves have become badly yellowed, although the paper itself maintains its nature and strength. It is a matter of much importance that books carrying records, deeds, register of events, and in fact information of any permanent interest, should be coloured with pure, unfading and non-reactive dyestuff. For this reason, ultramarine, if it is to be used at all, must be of the highest state of purity, more particularly in regard to traces of sulphur and sulphides. Smalts, however, embodying as it does a perfect guarantee, should most certainly be given the preference if at all permissible.

Chlorine and its oxides have a vigorous bleaching effect upon ultramarine. The presence of chlorine in paper, in a free state is perhaps a most unlikely occurrence, although it is not an impossibility. The most probable result of overbleaching or residues of the chemist is the formation of oxycellulose and chlorine oxides. In contact with ultra-marine and aided by the heat of the drying cylinders there is distinct possibility of a degradation of colour. The action is in fact (as it also is with mineral acids) a proper bleaching action, for the colour goes directly toward white.

Probably the most aggressive opponent of ultramarine as a colouring material, is alum. In the case of the lower grade account-book papers, alum goes into the pulp in fairly large proportion as an ingredient of the size, in combination of course with resin. The redder shades of ultramarine are far more susceptible to the onslaught of alum than the greenish variety, hence for engine sized pulp they should never be entertained. In actual practice it is more practical and economical to resort either to indanthrene or an organic substitute. Higher grade pulp, intended for ultimate tub-sizing and loft or air drying often takes a small percentage of alum and resin in order to produce a firm web, sized throughout, and incidentally to effect some degree of economy in the gelatine usage. It is very necessary, even here, to keep the proportion of alum as low as convenient if the fullest effect of ultramarine colouring is to be secured and ultimate degradation counteracted. In the case of hand-made paper and the absolutely highest grades of loose-leaf ledger paper, no alum whatever is introduced into the pulp, but a small amount goes into the gelatine or glue. Here, again, if ultramarine is the selected colour, it is essential to keep the alum at the minimum, and free from acid.

The presence of free acid in alum is hardly to be expected on the better grades, but it is necessary to keep a control over mill supplies. Lower grades have often been found to exhibit traces of active acid. The usual test, consisting of adding alcohol to the powdered and dried sample, extracting the acid and titrating with decinormal caustic soda in the presence of methyl orange, should be applied at regular periods.

Heat promotes reaction, and excessive heat promotes rapid concentration where alum and ultramarine are concerned. The blue of an engine sized ledger paper will be practically faded during the traverse and return hot drying processes. Therefore in the case of rubber made in part resin sized stock the temperature must be sufficient to just perform the drying without overheating, so far as tinted paper is concerned there is no need to shut an absolutely dryness until after the penetration of the size.

The commonest sample sold as the effect of alum was made by repeating in this stage. Four batches of ~~the same~~ ~~the same~~ ~~the same~~ prepared from identical col-

ton stuff. The first contained 2% resin and 2% alum, the second, 2% resin and 4% alum, the third, 2% resin and 6% alum; all three were dyed with 1%. A quality light blue ultramarine. A fourth batch consisted of the same pulp, sized 2% resin, 4% alum and no colouring matter. After pressing and drying over a heated cylinder the sheets were examined and found to reveal varying depths of shade, increasing proportionately in shade between No. 1 and No. 2, and No. 2 and No. 3. For three years consequent upon this, the sheets lay enclosed and away from light or other possibly adverse influence. After this period they exhibited the same ratios of shade variation but all had become quite bleached round the edges. The white sample remained perfectly pure and unaltered in any way. Obviously the effect of alum increased in proportion according to the amount added to the pulp. In every case its influence during storage was adversely felt, and this on a good quality of ultramarine.

The latest comer in blues for azure stock is indanthrene, a pigmentary dyestuff, insoluble in water and claimed to be fast to light, air, acid and alkalis. It is used in the oxidized state and is in some instances replacing ultramarine on account of its claim for superior fastness and permanency. Another feature is the ease with which it may be manipulated and prepared for use. It goes thoroughly into solution and thereby gives even-sided colouration, a thing unknown with smalts and practically so with ultramarine. The tones of indanthrene do not, however, compare so favourably with ultramarine although they do not suffer by comparison with smalts. The essential factor toward obtaining the full value and purity of tone is a thoroughly washed and bleached pulp. This, of course, may almost always be presumed in the case of high grade account-book paper. The time is hardly ripe yet for a final judgment to be pronounced upon indanthrene as a substitute for the prevailing mineral blues, but there is no doubt it is a dyestuff of great promise. Perhaps those with a more extended use and experience may be able to set forth some data of substantial value to the home paper-makers.

PULP LIMITS TO BE AUCTIONED.

The Quebec Government has decided to open new districts to lumber and pulp industries and will auction off limits in the Abitibi and Lake St. John districts during the months of August and October. In the Lake St. John region the territory to be opened is north of the lake and in basin of the Mistassini and Rat Rivers. In the Abitibi it is situated south of the Transcontinental, but on the north slope in the basin which empties in James Bay. This tract is traversed by the Pisson Blanc, Harricana, and Belle rivers. Both limits have been most carefully surveyed by the Forestry Service.

These concessions will call for the development of the water powers in the districts and will carry the obligation to construct pulp mills of a specified capacity within three years. The delay between now and August is to allow opportunity for exploration and permit of advertising the proposed auction, not only in Canada but also in the United States, Great Britain and France, as the Government wishes to attract the attention of foreign capitalists to the great natural resources of the province.

The Government has appointed five official guides to further the interests of colonization in the Abitibi district and show settlers what that district has to offer.

A MEANS TO MEASURE THE GLAZE OF PAPER

Outline of the theory and construction of the glarimeter, an instrument designed to provide a simple method of specifying the amount of glaze.

By R. L. INGERSOLL

The subject of glare from paper is one which has been attracting ever-increasing attention of late on the part of both publisher and paper maker. The demand of the reading public for a paper of less gloss, which shall cause less strain on the eyes, has already been met by a number of magazine and textbook publishers, and it is apparently only a question of time before the use of highly calendered paper will be a rarity for ordinary reading matter. This is especially probable in view of the improvements now being made in the halftone and other reproduction processes. It becomes then very desirable to be able to specify exactly the quality of any given paper as regards its glossiness or glaze—these terms being used in the present case to mean that quality of paper which gives rise to glare—and this article describes a simple instrument.

It is almost obvious that a satisfactory method for measuring glaze or glossiness must be optical rather than mechanical in character, for the smoothness of a paper is by no means a safe measure of its qualities in this respect. Following a suggestion made to the writer by Mr. J. H. Thickens, formerly of the Forest Products Laboratory of the United States Department of Agriculture at Madison, Wis., but now of the Beaver Companies, Buffalo, N.Y., to the effect that it might be possible to apply polarized light to the measurement of glaze, some experiments were performed in the Forest Products Laboratory which led to the subsequent development of the instrument about to be described.

To appreciate the principles involved, it seems well first to discuss briefly the character of the light reflected from a sheet of paper. As pointed out in numerous articles and papers by Black and Vaughn, Sweet, Luckiesh and others, one may distinguish in this connection three different types of reflection. These are: Specular reflection, as from a polished surface of metal or sheet of glass, the "angle of reflection" equalling in this case the "angle of incidence"; diffuse reflection, as from a perfect matte surface, characterized by the light being sent off almost equally in all directions from the surface, and a combination of these two which might be thought of as produced by overlaying a perfect matte surface with one or more sheets of glass.

The first type, or specular reflection, causes what is known as "glare" from the paper; that is, the brilliant directly reflected light which to a certain extent dazzles the eye of the reader, causing contraction of the pupil with consequent loss of visual acuity and resulting eye strain. The diffuse reflection gives rise to the soft, evenly illuminated appearance of a matte surfaced paper, which if used with a dead-black ink gives the combination which affords greatest ease to the eye of the reader. As a matter of fact, it is the third type which is really characteristic of the reflection from paper, as the most highly glazed paper still gives a little diffuse reflection, while even as dead a surface as that of a soft blotter shows a small amount of specularly reflected light.

It is characteristic of most glass surfaces that light reflected from them at an angle of 57.5 deg. is (almost) completely plane-polarized, and the writer found by

experiment that the same is true of the specularly reflected component from paper. Pieces of glazed white paper, calendered black cardboard, calendered white paper and brown solio paper all showed at this angle a polarization of the glare component estimated at more than 99 per cent complete. This instrument, then, was designed to measure the glare by determining the fraction of the light reflected from the paper at an angle of 57.5 deg. which is polarized, the illumination falling on the paper at approximately this same angle.

It must be kept in mind that it is not the absolute brilliancy of the glare spot which is to be measured, but, rather, the fraction of the total light entering the instrument which is glare; this, in the writer's opinion, is the basis on which the matter should be discussed, as it is the relative proportion of glare and diffuse reflection which determines the readability of a given paper rather than the absolute magnitude of either.

The glare, or, as it might be called, percentage glare,

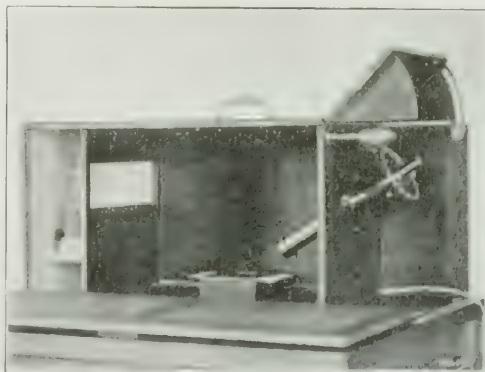


Fig. 1—Instrument Used in Measuring Glaze of Paper.

as measured in this way will evidently not depend on the intensity of the illumination, but it will be greatly influenced by the shape and extent of the source of light, whether it be broad or narrow, a window or an incandescent bulb. It is necessary, then, to specify some particular type of illumination to which to refer all the measurements. For use with this instrument the illumination chosen is that from a vertical opening 3 in. square whose center is at a distance of 11½ in. from that of the (horizontal) test piece of paper and the line from whose center makes an angle of 57.5 deg. with the perpendicular to this sheet. The opening is covered with two thicknesses of tracing cloth, behind which is placed a tungsten lamp rated at from 40 watts to 60 watts, with reflector. It must be understood that, while the selection of this arbitrary standard of illumination is highly desirable, it is not entirely necessary, for a larger or smaller opening would merely result in lowering or raising the fraction which represents the glaze of each specimen of paper

and would not, in general, alter the order in the series in which any particular specimen came.

Description and Theory of Instrument.

The instrument as designed and constructed at the Forest Products Laboratory is shown in Figs. 1 and 2. Light from the window S, already described, falls on the paper at P, this being covered with a small brass frame which keeps the sample perfectly flat and exposes only about a square inch of the surface. The construction of the part A is shown in Fig. 3. The light passes first through a 1/4-in. diaphragm, part of the opening of which is covered with a small Nicol (Lippich) prism N, and the remainder with a piece of smoked glass G ("No. 2 smoked glass") which absorbs about one-half of the light. The beam then passes through the eyepiece, which is another Nicol (Glan-Thompson) prism M, and thence to the eye. The prism M is mounted to rotate in a divided circle C, which reads with the aid of the vernier V to five minutes of arc.

On looking into the eyepiece one sees a divided field of view (Fig. 4), with the Nicol N below, say, and the smoked glass G above. The instrument is carefully adjusted so that N shuts off completely the specular

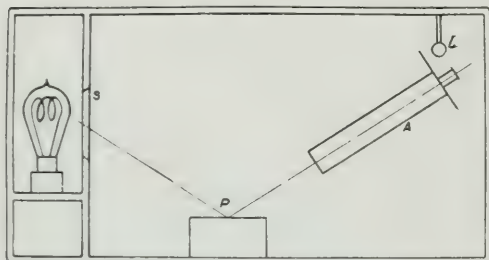


Fig. 2—Diagrammatic Section of Glarimeter.

polarized) component of the light from the paper. A measurement is made by turning the divided circle until the two fields appear of equal brilliancy, or, in other words, until the dividing line between the two fields seems to disappear. This gives a reading which enables one at once to compute the glare.

To show how this is done it will be necessary to enter into a brief mathematical discussion of the theory of the instrument. Let x represent the fraction of the light which is plane-polarized; in short, let x represent the glare as defined above. Also, let a represent the transmission coefficient for light polarized in its plane, of the prism N, and b the transmission coefficient for the smoked glass. Then the intensities of the two beams transmitted through this part of the instrument will be proportional to $1/2a(1-x)$ from N, and b from G.

When these beams are viewed through the eyepiece prism M, the principal plane of which makes an angle Q , with that of N, these intensities are reduced to $1/2a(1-x)\cos^2 Q$ and $b\cos^2 Q$ respectively.

When these two beams are made equal by altering the angle Q , $1/2a(1-x)\cos^2 Q = b\cos^2 Q$, or $1-x = 2b/a$.

The measurement of x , a reading is made on unpolarized illumination, followed by a sheet of soft blotting paper, placed on the surface (see above) in which case, $x = 0$.

$$\frac{1}{2}a\cos^2 Q' = \frac{1}{2}b, \quad \text{or } -\cos^2 Q' = \frac{b}{a} \quad (2)$$

Then one may write for (1)

$$\frac{1-x}{1+x} = \frac{\cos^2 Q' \sin^2 Q}{\cos^2 Q' \cos Q} \quad \text{which, after a little reduction, becomes} \quad \frac{1-x}{1+x} = \tan^2 Q' \quad (3)$$

It appears then from equation (3) that it is possible to determine the quantity x if the two angles Q and Q' are known. As Q' may be determined once and for all and is really a constant of the instrument, this means that a determination of Q is all that is necessary, and this is measured by taking the average of a series of, say, from three to five settings with the instrument. Having determined Q , the value of x is given at once by means of a small table computed with the aid of equation (3), so the whole process of determining the glare of a particular specimen requires hardly a minute of time.

The following measurements made on some standard papers show the use of the instrument:

Paper	Per cent. Glare.
Warren Standard Warrentown Olde Style	15.1
Warren Standard Warrentown Eggshell, 70-lb.	18.3
Warren Standard Cameo Plate, white	19.3
Fine ground glass	21.4
Warren Standard Artogravure, white, 80-lb.	22.4
Bryant Paper Company, British opaque	38.9
Warren Standard Cumberland M. F., 70-lb.	43.0
Warren Standard Library Text	45.7
Bryant Paper Company, English Finish Mag.	55.8
Postal card	63.7
Glazed onion-skin, 8-lb.	66.7
Warren Standard Cumberland Super	75.4
Warren Standard Superfine	79.3
Warren Standard Lustro coated book	77.5
Warren Standard Cumberland coated book, 100 lb.	79.7
Warren Standard Printone 80-lb.	80.4
Warren Standard Superfine coated book	82.5
White glazed paper	90.5
Brown solio paper	99.2

One of the most interesting tests as that conducted on a series of sheets of unsized newspaper made at the Forest Products Laboratory, the sheets being originally identical but differing in finish by having been passed through the calendering rolls once, three times, five times, and so on, up to twenty-nine times, respectively. The measurements on this series are as follows:

Paper	Per Cent. Glare.
Uncalendered	27.7
One pinch	33.3
Three pinches	45.0
Five pinches	46.7
Seven pinches	52.8
Eleven pinches	57.0
Nineteen pinches	62.2
Twenty-nine pinches	64.8

This combination of Lippich prism with smoked glass might profitably be supplanted by a two-prism field of view with polarization planes at right angles. The present simple arrangement is so satisfactory, however, that it is not believed that the more complicated optical part would justify the additional expense.

An inspection of the results of these tests developed some striking facts. It will be noted that glazed onion-skin paper showed when tested in this fashion almost the same glare as postal card, and this was so inconsistent with the results of a hasty visual inspection—which would make the glare from the onion skin far greater than that of the postal card—that a particular study was made of this case. It was found that when the onion skin was laid perfectly flat so as to avoid reflected light, the eye estimates of glaze approximated much more nearly to the indications of the instrument. The consideration of this and one or two similar cases served finally only to strengthen the confidence in the results obtained with the instrument, and to show that casual eye observations of glaze are unreliable when the papers are of widely differing texture, for example, cardboard and thin paper.

Black and colored papers give higher glare readings than do white papers of the same finish. A little thought will serve to show that this ought to be so, since the specularly reflected light is almost independent of the shade of the paper, while the diffusely re-

duced, but one is able to state with positiveness that a paper which shows a 50 per cent glaze reading will give less glare than one of 60 per cent and, other things being equal, will be easier on the eye of the reader than the latter. The instrument will permit the printer to order a book paper of less than, say 40 per cent glare,

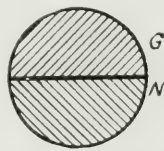


Fig. 4—Diagram illustrating Divided View on Looking in Eyepiece.

and will enable the paper maker to meet this requirement with certainty; and if the net result shall be to render even the slightest service to the movement to abolish, where possible, the annoyance of glare, it will be felt that it has achieved its purpose.

Perhaps note should be made of the fact that a patent on the instrument and method has been applied for. *Electrical World.*

ABITIBI OPERATIONS.

Excavations for the foundation of the paper mill, the largest of the several buildings composing the Abitibi Pulp & Paper Company's plant at Iroquois Falls, will commence within the next few days, the mill to be ready for occupancy on June 1st, but the construction of this building will not interfere with the starting of the pulp machinery some time in May. Present plans are that the wheels will turn at the pulp mill some time in May.

The paper mill will be 500 feet in length and nearly 300 feet in width, being much larger than any of the other buildings now clustered around the edge of Iroquois Falls. It will be like the other buildings, of solid concrete construction, absolutely fireproof. Forty thousand cords of pulpwood are piled on the banks of the Abitibi and Black Rivers and tributaries waiting to be floated down the rivers to the falls when the ice leaves. It has been decided to keep a gang of 250 men at work in the bush during the summer months cutting wood on the large reserve of the company. The total now cut awaiting the spring freshets will be increased by thousands of cords of settlers' pulp, to be shipped in by rail. At the plant at Iroquois Falls 475 men are now employed, with 250 men in the bush and at the Couchiching Falls dam.

Contracts are now being signed up for the equipment of the paper mills. Contracts for the paper machines have already been signed up. These will consist of one 204 inch machine, manufactured by Walmesly, of London, England; two 188 inch and one 158 inch machine, manufactured by Pusey & Jones, of Wilmington, Delaware.

The James McLaren Co., Ltd., of Buckingham, Que., have opened an office at 1123 Broadway, New York, for the sale of ground wood pulp. Guy E. Robinson, manager of the sales department, is in charge.

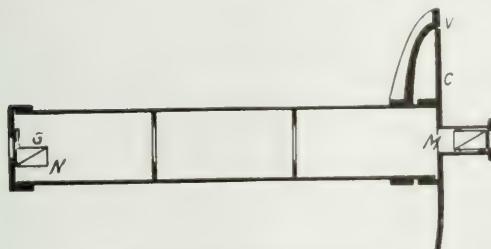


Fig. 3—Diagram showing Construction of Part A of Glarimeter

flected light is much less for the darker shades. The glare, as defined above, will accordingly be higher for the darker colors. Readings on solio paper of various shades gave measurements in illustration of this point.

Metal surfaces, since they do not plane-polarize light by reflection, cannot be tested with this instrument. Thus, polished silver will yield almost the same readings as does a perfect matte surface. If a type of paper exists which gives what is termed "metallic reflection," it would not be possible to measure its glare in this way either; however, the writer has never seen any such paper and doubts if any such exists. The case which would be thought to approximate most closely to this, namely, brown solio paper, still gives almost perfect polarization on reflection. In view of this fact the writer feels that the indications of the instrument may be accepted with confidence for all classes of papers.

In conclusion, it is believed that this instrument will fill a rapidly growing need for some simple and exact means of specifying the glaze of paper. One does not need to analyze what a glare reading of 50 per cent with this instrument means; whether one can say that half the surface reflects as glass and the remainder as a matte surface—an erroneous conclusion, as a little thought will show—or that the surface is a mass of fine wrinkles, all of which reflect specularly but in so many directions that diffusion results. One neither needs nor is able to say exactly how this glare is pro-

Economical Operation of Paper Machines

Carelessness and neglect in the treatment of the paper machine and its spare parts may, as is well known, lead to great expenses. It is, for instance, not advisable to have only one long piece of hose lying at the side of the paper machine, as its length makes it difficult to use and it is subject to a great amount of wear by being constantly pulled backwards and forwards along the floor of the machine. There are of course such hose which are provided with a metal spiral or hemp twine spirals to protect them against the rapid wear. This however deprives the hose of its flexibility. It is much more practical to employ a number of shorter pieces of hose at various parts of the machine instead of one long length of hose. This further enables water to be given at several places at the same time, so that the cleansing of the wet-end takes place with much more rapidity and the pauses become shorter. A piece of hose should also be fixed in the neighborhood of the pulp chest so that the latter may be cleansed when necessary. If special circumstances demand the use of a long piece of hose the latter should not be allowed to lie upon the floor, but should be hung by means of hooks at the side the wet end. This not only saves the hose but removes the danger of the attendants stumbling over the same. Rubber hose should not be allowed to lie for any great length of time in one position on iron or other metal parts, as some kinds of rubber become hard and brittle at such places. It is advisable to wrap such iron or metal parts with a piece of old rubber, felt or the like in order to prevent any direct contact. Hemp hose, notwithstanding impregnation, is not serviceable on account of the wet conditions. The hose should have such a length as to allow of its being shortened once or twice at the end where it is fixed to the mains at which place, it is well known the hose suffers most severely without being too short.

Deckle straps are still more expensive than hose, and should be carefully protected against grease and oil. Any spots which may occur should be immediately removed with warm soda lye or benzine. Care should also be taken that the wire and the deckle strap have exactly the same speed, as otherwise the latter would wear and become rough by the friction, as a result of which the edges would lose their sharpness. The guide rolls of the deckle straps should be provided with cups to prevent all dropping of lubricating oil. The guide rolls should rotate with the least possible friction. Further, heavy deckle straps, for instance in the case of Fourdrinier cardboard machines, are best driven from the couch roll.

Wherever possible two strainers should be provided so that in the case of one being stopped up it could be simply cut out and cleaned without having to stop the machine. In cases where papers which are exceptionally fine sorting both strainers can be changed at the same time, the one strainer being placed somewhat higher than the other so that the pulp after passing the first strainer, immediately enters the second which is provided with much finer slots. The mesh of the strainer should never be cleaned or scraped with pieces of sheet steel, hoop iron and the like, as the slots are widened by this process. Soft kumera wood or stiff sea grass brushes are most suitable for this purpose. On the inside the slots should be sharpened by means of a piece of medium-hard wood cut to a sharp edge and run only with this the slots are

rubbed backwards and forwards, whereby the thin piece of wood pushes the knots over to the other side, where they can be easily brushed off. Flat strainers should be so erected that they can be easily raised into a perpendicular position. It is for instance possible to erect a winch on the outside of the pulp chest, and connect the same up to the frame of the strainer which is to be cleaned, by means of a wire rope. This device works much quicker and is much safer than lifting the heavy frame up by hand.

Froth blisters are a frequent cause of breaks in the paper. The formation of froth often takes place as a result of the back water from the wire, containing a concentration of froth-forming stuffs, being repeatedly employed, and sometimes as a result of the stuff having too great a drop from the pulp chest to the wire. To remove the froth before the gate a shower pipe should be fitted pointing almost vertically upwards so that the falling drops destroy the foam.

For removing wrinkles the tender should have an ample supply of strips of paper or mull-muslin of various widths always at hand. Strips of felt or old pieces of belting should also always be kept in readiness in order to be able to regulate the tension between the various parts of the machine at any moment. For fixing these strips on to the belt pulley a mixture of 50 parts of molten resin and 50 parts of drip oil, which should also always be kept in readiness, in use, has been found to give excellent results. The latter points will probably appear superfluous to some paper makers but the observation of the same will tend to save many kilograms of waste paper.—Der Papier Fabrikant.

Properties of Straw Pulp

A writer in the *Wochenblatt*, who has had much experience in the manufacture of straw pulp, has observed that the pulp frequently turns out extremely "greasy" in working, sometimes less so, and occasionally quite "free." He attributes these variations principally to the constitution of the raw material. Wheat straw nearly always gives a more "greasy" pulp than rye straw. These differences are frequently still more increased by the nature of the soil and the manner of manuring. Many artificial manures, especially phosphates, influence the boiling and bleaching as well as the quality of the pulp. The straw also varies in different years, and in one year the yield of pulp may be considerably less than in another year, also more "greasy" in working. Straw grown on soil heavily manured with phosphates gives a lower yield than straw from soils treated with natural manure. Of course wheat straw must be boiled differently from rye straw, and it is desirable also that straw grown on different soils be treated in correspondingly different conditions if the origin of the material be known. As it happens, the results tend to show considerable variations both in ease of bleaching and in behaviour on heating. Beating is generally performed in refiners, and if the stuff is not boiled sufficiently soft, it is necessary to beat more heavily, and the refiner stones require sharpening more frequently in order to obtain clean stuff. All these circumstances lead to a more "greasy" pulp. The hardness and fineness of grain of the refiner stones naturally exert a great influence on the condition of the stuff, and the writer has obtained the best results with a refiner having a lava running stone and a sandstone fixed stone. Wheat straw as a rule is boiled and bleached less easily than rye straw,

and the pulp from rye straw is nearly always "freer" in working and generally whiter in colour. When straw pulp shows a tendency to roll up into balls in the hollanders and chests, which is a sign that the material has been too strongly boiled. On the other hand, if it is not sufficiently boiled the stuff is hard, not easily bleached, and requires heavier milling. "Free" stuff can be made slightly more "greasy" by suitable treatment in the hollander, but no considerable change in the character of the stuff can be effected at this stage. Straw pulp, on account of its high white colour and cleanliness, is very well suited as a component of the finest grades of papers, particularly post papers. It imparts great hardness, rattle and a fine clear look through. A large addition of straw pulp is very useful if it is desired to increase the tensile stretch of the paper. Other advantages are that it is easily sized, and carries loading particularly well. The World's Paper Trade Review.

Safety First

This grand scheme for protection and saving of human life is undoubtedly well known to the readers of this magazine, not only from a previous article, but also from articles in other trade papers and in the daily press.

In this we only desire to give a few practical hints which may be a help to men in the pulp and paper line, anxious to see this movement organized at their mills, and who are doubtful how this should best be accomplished.

The movement must first of all have the full approval of the management.

A committee should be appointed consisting preferably of:

- 1a—An independent, practical man as chairman.
- 2a—One or more representatives of the company.
- 3a—Superintendents or foremen in charge of departments or outdoor and construction gangs.
- 4a—Two or more representatives selected amongst the different crews.

This committee should make thorough investigations monthly, or oftener if considered necessary, investigating everything and every place inside as well as outside the mills, where accidents are likely to occur.

When new construction is going on, one man of the committee may be appointed to make daily investigations and to report to the committee, as this kind of work is usually the chief source of injury to the employees.

Brief reports should be submitted to the management, giving details of proposed improvements and reasons therefor, and now fulfillment of promised improvements, inside reasonable time, should be reported as well.

In the north European countries, where there is strict Government inspection to guard the safety of the industrial employees, the very largest industrial companies have themselves taken up the "Safety first" movement and based the same on the above principles.

They are satisfied that this movement has not only saved them a considerable amount of money, but has also brought them the best of the skilled men in the line, and other companies have found it necessary to follow their example.

There is no doubt that the manufacturing companies here in Canada, who have to take a larger responsibility for accidents occurring in their mills and factories than companies in most other countries, and where the inspection is negligible, would derive great benefits from joining the "Safety first" movement.

The expenditure for safeguarding the employees, suggested by a "Safety first" committee will prove small compared with the sums the company will otherwise most likely have to pay to employees injured or crippled, when these are not insured by the company, and there is no doubt that a general adoption of the "Safety first" policy will in time bring down the premiums for accident insurance, collective as well as personal, which are very much higher here than in Europe.

Many a good employee is also lost because he considers the conditions he works under too dangerous.

In whatever relation you stand to the industry, investigate this question carefully and you will find that it is to your benefit to join this movement.

More than that, human lives are too valuable to be wasted, especially in a sparingly populated country like ours.

Wrapping Paper Div. A.P.P.A. Meeting

Special to the Pulp and Paper Magazine.

Chicago, Ill.

The wrapping paper division of the American Paper & Pulp Association held an Executive Meeting at the Congress Hotel in this City this morning, and several interesting matters were discussed. Frank L. Moore, of Watertown, N. Y., was in charge of the session, and Arthur C. Hastings, President of the American Paper & Pulp Association, was present.

Two definite results of the meeting may be enumerated. One is that the wrapping paper division may be expected to stand firmly by the parent organization and work co-operatively for the success of the organization. The other is the awakening of a deep interest in organization plans among the paper manufacturers of the west. There were approximately thirty paper manufacturers in the wrapping paper branch of the business represented at the gathering and two-thirds of this number represented the west. There were many representatives of Wisconsin and Michigan mills.

Following the meeting of the wrapping paper division, there was an informal executive session of those members of the executive council of the American Paper & Pulp Association who were in the city. No definite announcement of the proceedings of this meeting was given out, further than that the work of the wrapping paper division earlier in the same day was considered and received in good spirit.

The question of the advantages of organization at once came up for discussion. There were several speakers who made interesting addresses on the subject. The manufacturers were in harmony with the idea of strong organization and were led to realize the advantages to be gained, in the face of serious questions that must be faced from time to time.

Steps of organization were perfected, and it was determined that permanent quarters, in charge of a permanent secretary, should be maintained.

The meeting elected Mr. Moore as Chairman of the wrapping paper division and selected an advisory council as follows:

L. M. Alexander, Nekoosa-Edwards Paper Company, Nekoosa, Wis.

George C. Bayless, Bayless Paper & Pulp Company, Austin, Pa.

M. E. Marcuse, Bedford Pulp & Paper Company, Richmond, Va.

George E. Crafts, Orono Paper & Pulp Company, Bangor, Me.

Allen M. Fletcher, Fletcher Paper Company, Alpino, Mich.

At the conclusion of the meeting Mr. Moore discussed the steps taken with the correspondent of The Pulp and Paper Magazine, in which he said:

"We accomplished the purpose of the meeting. There is every indication now that the wrapping paper division will be a strong division of the American Paper & Pulp Association. The manufacturers who attended were enthusiastic on the subject of organization. The western manufacturers now are thoroughly interested. Heretofore there has not been a great effort devoted to the enlargement of the organization but this work will be prosecuted to the utmost in the future. We will have permanent headquarters, in all probability in connection with the headquarters of the American Paper & Pulp Association in New York."

Mr. Moore concluded by saying that there is every indication that the wrapping paper division will stand strongly with the parent organization, and Arthur C. Hastings, the president of the latter, appeared very pleased with the results of the gatherings of the several divisions. He expressed himself strongly in favor of co-operation in organization. To your correspondent, he said in part:

"The purpose to-day was to effect a good working organization of the wrapping paper division. The work to be done is such that the parent association can not well handle the work of each division; therefore it is better to have each division closely organized within itself. On the other hand it is essential that each division stand strongly behind the parent body and such co-operation is assured by the sentiment expressed to-day."

President Hastings said it has become necessary to the welfare of the paper manufacturers to stand shoulder to shoulder in their respective divisions because of the ever present problems with which the manufacturers are confronted, both at the instance of the government and otherwise. The executive of the association said the meeting of the executive council members was merely informal and did not constitute a meeting of the council, as only a part of the membership was present. Besides the wrapping paper division, there were represented the news and writing paper divisions.

MILLIONAIRE LUMBERMAN DEAD.

Francis H. Waterhouse, the multimillionaire lumberman, of Paul, Minn., died at Pasadena, Cal., on April 4. He was 75 years old. He was stricken with a heart attack and had symptoms developed which caused his death. He had been spending the winter at his winter home at Oak Knoll.

U.S. Treasury Drops Appeal in Importers' Case

Will Make Refunds of Duty Paid on Imports of Pulp and Paper From Canada.

The Board of United States General Appraisers has begun deciding a large number of importers' protests relating to wood pulp and paper produced and manufactured in Canada, and which are claimed free of duty under the terms of the Canadian Reciprocity Treaty. The test issue, standing in the name of the American Express Company, and F. Bertuch, was decided favorably to the importers by the United States Court of Customs Appeals last May. The Treasury Department, however, demurred to paying to the importers refunds involved in the issue, estimated to-day by Albert H. Washburn of Comstock, and Washburn, counsel for the protestants in the test case, to amount to \$1,000,000 or more, and at the same time, instructed Assistant Attorney-General Wemple to ask the board not to decide the hundreds of protests raising a similar question filed with the lower customs tribunal. The board acquiesced in the request, pending action by the department.

The Treasury authorities announced that they proposed introducing a bill into Congress to give the Supreme Court the right to pass upon questions raising constitutional and treaty issues after decision by the customs court. It was planned to have the Supreme Court pass upon the pulp and paper cases in the hope of securing a reversal of the lower court's decision. While the bill has been introduced and is under consideration by the Judiciary Committee for the House of Representatives, Mr. Wemple informed its members at the recent hearing in Washington that the Treasury Department had decided not to prosecute an appeal in these cases to the Supreme Court in the event of the present bill becoming law. This decision having been communicated to the Board, the latter tribunal is now expected to act vigorously and dispose of the great accumulation of cases favorably to the importers and in harmony with the findings of the Customs Court.

It is assumed here that the treasury department is now prepared to make the heavy refunds to importers as fast as the protests are decided by the Board and re-liquidation by the customs authorities.

RIORDON DIRECTORS RE-ELECTED.

At the annual meeting of the Riordon Pulp and Paper Company held in Montreal on April 1st, retiring officers and directors were re-elected as follows: Charles Riordon, President; Carl Riordon, vice-president; Charles E. Reed, secretary-treasurer; J. G. Riordon, F. W. Avery, Walter G. Whittle, W. J. Douglas. At a special meeting of the stockholders held after the regular annual meeting the by-laws of the company were amended so as to enlarge the company's borrowing powers.

The Tariff Changes

The principal changes effected by the new tariff schedule submitted by the Finance Minister are as follows:

Item 379.—Rolled iron or steel angles, beams, channels and other rolled shapes and sections of iron or steel not punched or drilled or otherwise further manufactured, weighing over 120 pounds per lineal yard N.O.P., not square, flat, oval or round shapes, and not being railway bars or rails, changed from \$2, \$2.75 and \$3 to \$2, \$3, and \$3 per ton under British preferential intermediate and general tariffs respectively.

New item, 39C.—Cassava flour, when used in the manufacture of explosives, is made free under all tariffs.

New item, 99 A.—Dried or evaporated bananas, per pound, are made free, and $\frac{1}{2}$ cent under general and intermediate tariffs.

113.—Cocoanut, sweetened or not, per pound, made 3 cents, 4 cents, and 4 cents, instead of 5 cents.

New item, 17A.—Alcohol, or refined fusil oil, imported under license from the Inland Revenue Department, to be denatured for use in the manufacture of metal varnishes or lacquer, is made free.

184.—Item regarding duty on newspapers and magazines and weekly literary papers unbound, and fashion plates, is amended by adding the words "when imported in single copies in sheet form with magazines or periodical trade journals, these being free."

New item, 208 A.—Chloride of lime and hypo-chloride of lime in packages not less than 25 pounds transferred from the free list and made dutiable at ten cents and fifteen cents per hundred pounds, when in packages of less than 25 pounds, $17\frac{1}{2}$ per cent, 25 per cent, and 25 per cent, instead of free.

210 A.—Caustic soda in packages not less than 25 pounds changed from free to 1-5 cents and 3-10 cents; when in packages less than 25 pounds the duty is $17\frac{1}{2}$ per cent and 25 per cent.

296.—Talc, which was formerly free, is put in the enumerated list, and thus made dutiable at 15 per cent, $17\frac{1}{2}$ per cent and 20 per cent.

306 A and 306 B (new item).—Building stone sawn on four sides is made dutiable at fifteen cents per 100 pounds, and when further manufactured, at 45 cents per 100 pounds, instead of 20 cents.

New item, 315 A.—Carbon electrodes of over 35 inches circumference changed from three to twenty per cent.

New item, 327 A.—Silvered bases, but reduced from 30 per cent to 15 per cent.

353 A.—Aluminum leaf reduced from $27\frac{1}{2}$ per cent to free.

375 A.—Ferrosilicon made \$4.50 a ton, instead of \$2.50.

378.—Galvanized hoop steel changed from 30 per cent to \$7 per ton.

386.—Wrought or seamless iron or steel tubing, from four to ten inches in diameter, changed from 10, $12\frac{1}{2}$ and 15 per cent to 20 and 30 per cent.

New item, 398 A.—Wrought or seamless iron or steel tubing over ten inches in diameter changed from 10 and 15 per cent to 10 per cent.

410.—Coil chain and links under $1\frac{1}{8}$ inches, changed from 5, $7\frac{1}{2}$ and 10 per cent to 15, 20 and 20 per cent.

411.—Malleable sprockets, chain or link belting, chain made free when used in agricultural implements,

whereas it was formerly free for all purposes.

445.—Mowing machines, harvesters, self-binders and reapers changed from $12\frac{1}{2}$, $15\frac{1}{2}$ and $17\frac{1}{2}$ per cent to $12\frac{1}{2}$ per cent on all three tariffs.

445 A.—Malleable castings for implements, mentioned in 445, are retained at 15, $17\frac{1}{2}$ and $17\frac{1}{2}$ per cent.

446 A.—Parts for traction ditching machines, formerly dutiable, made free.

453 A.—Electric dental engines changed from free to 15, $17\frac{1}{2}$ and $27\frac{1}{2}$ per cent.

471.—Round rolled wire rods in the coil of iron or steel, not over 3-8 of an inch diameter, changed from free to \$2.25, \$3.50 and \$3.50 per ton; when imported to manufacture wire in the coil, for use in the manufacture of chain changed from free to \$2.25, \$3.50 and \$3.50.

478 A.—Iron and steel sections for saddlery hardware placed on the free list, where formerly they paid a general tariff of \$7 per ton.

495 R.—Cork slabs, boards, planks and tiles, produced from cork waste or ground cork, changed from 15, $17\frac{1}{2}$ and 20 per cent to 20, 30 and 30 per cent.

533 A.—Garnetted wool waste in the white, transferred to the free list instead of being dutiable at $7\frac{1}{2}$, 10 and $12\frac{1}{2}$ per cent.

542.—Jute or hemp yarn, plain, dyed or colored, use limited to prevent free importation of twine.

548 A.—Paper twine for furniture changed from 20, $22\frac{1}{2}$ and 25 per cent to free list.

575.—Tape lines are given a uniform duty of 25 per cent, $33\frac{1}{2}$ per cent, and 35 per cent, where formerly there were several rates of duty.

605.—Buttons of vegetable ivory, changed from $22\frac{1}{2}$ per cent, 30 per cent and 35 per cent to five per cent per gross, plus twenty per cent.

671 A.—Parts of corset clasps and wires, transferred to the free list where formerly dutiable in the general tariff at 3 per cent.

692.—To allow foreign governments to make presents for saving human life without duty being charged for same.

Provisions for Drawbacks.

The provisions for drawbacks were announced as follows:

1017.—Lap welded tubing of iron or steel not less than four inch diameter and used in casing well or for natural gas transmission fifty per cent.

1019.—Bituminous coal, drawback of 99 per cent of duty extended to coke ovens, other than those owned by smelting works when intended for smelting and melting ores.

1021.—Wire rods used for the manufacture of fencing wire, 9, 12 and 13 gauge, 99 per cent of duty.

1022.—Charcoal used for smelting of ores, 99 per cent.

1023.—Rolled hexagon, iron or steel bars used in the manufacture of cold drawn or cold rolled iron or steel bars or turned and polished shafting, 99 per cent.

1024.—Yarn composed chiefly of wool, No. 30 and finer, in white when used in the manufacture of socks and stockings 99 per cent.

Under section 1212.—Aigrette, aigrette plumes, ostrich plumes and the skin or plumage of wild birds are prohibited for importation, but this does not apply to ostrich feathers, English pheasant and Indian peacock, the plumage of game birds or birds imported alive, or to specimens for museums or educational purposes. The prohibition will become effective on January 1, 1915.

UNITED STATES NOTES

Conferences regarding the wage scale for the workmen of all trades at all the plants of the International Paper Company were held at the Boston headquarters office of the company last week with satisfactory results. Four International Union presidents with committees from the 25 plants of the company were present.

International Paper Company of 30 Broad Street, New York, has declared its regular quarterly dividend of $\frac{1}{2}$ of 1 per cent. on preferred stock payable April 15. Books of the company closed on April 1.

The Economic Power and Products Company has been incorporated in Delaware, for the manufacture of paper from cotton stalks. The Company is being financed in Philadelphia, Pa. The officers, all Philadelphians, as shown by the prospectus, are: President, James M. Dyan; vice-president, General James B. Coryell and Elbert A. Corbin; secretary and treasury, William D. Miller. The company estimates that with the stalks from Southern cotton fields it can produce each year a quantity of paper that if made from wood pulp, would mean the deforestation of 800,000 acres of timber land.

In line with retrenchment policy the Pennsylvania railroad has issued orders cutting out the paper roller towels. That they are sanitary is not denied but the new style of towel has proven rather expensive. It may take some time before the paper towels entirely disappear as there is a large stock on hand, but in many of the local offices the linen towel has again made its appearance and the roller towels have been discarded. On some of the trains the paper towels will continue until the supply is exhausted. The officials have figured out that it is much cheaper to provide individual towels for their clerks and in each department cupboards are now being provided for individual towels. Arrangements will be made to have these towels laundered at the company laundries in New York, Philadelphia and Pittsburgh. Each employee will probably be allowed an average of four clean towels each week.

Assurances have been given to Second Vice-President, Business Agent Thomas Murphy of Eagle Lodge (dent W. C. Smith) of the International Paper Makers, and a delegation of members of Eagle lodge from each of the mills of the American Writing Paper Company, at Holyoke, Mass., and vicinity by the officials of the company that the three four system would be inaugurated in all the divisions of the company as soon as possible. Trade conditions prevented doing this immediately, but it will come, promised the officials of the company.

It seems that a contest for control will be waged at the annual meeting of the Union Bag and Paper Company, now meeting in New York. Carles is the request for proxies to be shareholders committee as well as the by-laws. A number of the stockholders, coming early, however, and the committee and management are speaking to themselves, and that the former has asked for proxies in conformity with its custom of for-

mer years. He added that it made no difference whether stockholders forwarded their proxies to the company or the committee.

Great Northern Paper Company distributed 10 per cent. in dividends in 1913, says the Lewiston, Me., Journal in discussing the paper market, and indications are this record will be duplicated in the current year. This company has the unique record of operating capacity continuously throughout the year. Through control of its sources of water supply, it is able to secure an adequate supply of water for power and paper making when mills in other parts of the country have shut down on account of drouth. The company's rated capacity daily. This may be increased during 1914 by the addition of a new machine to 600 tons daily. While the price of paper is lower than 1913, there is more "stability to the newsprint market," and this element is an important factor in shaping net profits. Just what the word "stability" signifies we shall know later. Meantime it is probable that International Paper Company will soon be able to get logs free of export duty from its valuable crown lands. Will there yet be an international concert in paper as there is in some other products? Such concert is possible. There are many ways of misconcert until the soft pedal is in ocular demonstration. Ten per cent. net is pretty fair for a Mellon year.

The cases of the Willamette Pulp & Paper Company of Oregon and the Western Co-operative Company against Clatsop County have been settled out of court. These actions were on an appeal from the ruling of the County Board of Equalization and were brought to set aside the assessed valuation fixed upon the plaintiff's timber lands. The settlement was effected as a result of the second cruise made of the timber. A similar suit brought by the Crossett Timber Company against the county is also reported to have been adjusted.

The American Writing Paper Company has adopted a new and novel method by which it is expected many improvements will result in its various mills which will help to bring the business of the company up to the highest point of efficiency. The plan is to have the superintendents and managers of the different mills visit the various plants and suggest any changes that they may think will be of benefit to the many different departments. Schedules of these "suggestion tours" have just been sent out to the mill superintendents and managers. These schedules are so arranged that the superintendent of a mill will not be a member of the same group, as the manager of the same. They will go in parties of five or six, and will probably make weekly trips. These trips will continue until every mill is inspected. On these trips the superintendents and managers will be expected, it is said, to make careful inspections of everything that comes under their observation. It is thought that some managers and superintendents will have certain ways of doing this or that kind of work that may not be in use in other mills and that by calling the attention of the other mill officials to these things, the company is certain to be the gainer.

The paper mill strike at Marinette, Wis., is over. The men returned to work last week and everything is moving nicely in the three paper mills there. The strike lasted less than two days. The men state that they were granted a raise of twenty cents a day at a conference between a committee of six appointed by the strikers and Gen. Mgr. Hoskins a compromise was arranged and later it was submitted to the employees at a mass meeting. The compromise was unanimously accepted and the night crew immediately left to resume work.

* * * *

As a result of the visit of the officials of the Union Bag & Paper Co. to Kaukauna, Wis., last week it has been decided that extensive improvements will be made to the mill there this year, involving the expenditure of upwards of \$50,000. A. Kimberly, Jr., vice-president of the company, C. B. Sanders, manager of factories, both of New York, accompanied by Thos. Getsham and T. M. Avery, special construction engineers, inspected the Kaukauna plant and at a business meeting held later in Chicago it was decided that the needed improvements be made and the construction experts are now busy preparing plans. The improvements will include a complete rebuilding of the flume beneath the mill, which will be laid in concrete and steel. New reinforced concrete floors will also replace the old wooden floors in various sections of the plant which have become badly rotted from age. The improvements to the flume and floors will be after the style of the recent reconstruction of the Thilmany flume, and will be built for future endurance.

* * * *

The fire loss occasioned by the burning of the paper mill of the Bedford Pulp and Paper Company, at Big Island, Va., last month has been adjusted and the company is now considering the question of rebuilding. It has not been determined yet whether the mill will be located at the old site or elsewhere. To locate the mill elsewhere would kill Big Island as a town for practically its entire population has lived from the mills pay roll for years.

* * * *

Fire which broke out in the woodroom of the Dells, Paper and Pulp Co. mill at Eau Claire, Wis., several weeks ago resulted in a loss estimated at \$2,000. Most of this was to machinery. The cause is not known but it is thought to have started either from friction in one of the belts or from the electric wires. The automatic springlers started work at once and if it had not been for them the fire would have gained a dangerous head. The building was not so badly damaged but what it can be used, but there will be a little delay to repair the machinery.

* * * *

Using as its slogan, "A new name but the same policies," the Taylor Burt Co., papermakers of Holyoke, Mass., has been reorganized as the Taylor-Logan Co., with Hon. James Logan, ex-mayor of Worcester, Mass., as a large stockholder and a director. Mr. Burt who was with the company at its beginning in 1905 sold out his interests and retired from the company in 1909. Mr. Logan has been a stockholder for a long time, and last year increased his holdings and consented to become a director. It was in recognition of this, according to a statement from the company, and of the help that the ex-mayor's support and council brought that the name of the company was changed. The Taylor-Logan paper and especially the brand known as "Public Service Bond," is sold all over the United States and Canada.

The company owns valuable land, water power rights and a modern, well-equipped plant at Holyoke, and it manufactures high-grade bond papers cover for adverteptus of Mr. Logan, the company will increase the size of its plant, and thereby extend its territory and increase its output.

* * * *

Word has just been received at Madison, Maine, from Boston that increased wages will be paid all employees of the Great Northern Paper Co., at its plants in Millinocket, East Millinocket and Madison, by an agreement reached by the company and union leaders. The agreement which is for two years followed four days of conference. The minimum rate of wages is advanced in every department. On May 1, a further increase will be made, as a result of which, 250 papermakers will receive an advance of 11 per cent.; 800 pulp and sulphite workers will receive 7½ per cent additional, and 250 engineers, firemen and mechanics will obtain increases amounting to an average of 10 per cent. In some instances, the increases amount to 20 per cent. The agreement provides for the six-day week, the eight-hour day for the papermakers, a nine-hour day for the pulp and sulphite workers and others; observance of jurisdiction as laid down by the A. F. of L. Laws; that there shall be no strikes or lockouts, and arbitration to adjust any disputes. The agreement is signed by General Manager W. A. Whitcomb for the company, International President J. D. Carey of the Papermakers, John H. Malin of the Pulp and Sulphite Workers and Timothy Healy of the Firemen's Union; New England Organizer Frank H. McCarthy, representing the Federated Trades Councils of Millinocket and Madison; John T. Mackin and W. P. Garin of the Millinocket Pulp Workers, Thomas Powers for the Millinocket workers, William F. Jones and George F. McCann for the Millinocket Pulp Workers' Union, Henry Capen for the Millinocket Firemen's Union and William A. Brown and John F. McDonald for the East Millinocket Federated Trades Council.

HOW TO DETECT SIZING.

Kollmann has made various attempts to detect rosin and animal size microscopically in paper. The behaviour of rosin and papers sized with animal size in the presence of the following reagents was tested: iodine solution, concentrated nitric acid, nitrate of mercury, potash lye and sulphate of copper (Biuret reaction), glacial acetic acid and concentrated sulphuric acid (Adamkiewicz), tannin solution, concentrated sulphuric acid and sugar (Raspail's action). Only Raspail's reaction and the tannin reaction were found useful, the presence of fat and casein in the paper being a condition.

Raspail's reaction for detecting rosin size. The paper is moistened on the object carrier with a concentrated solution of cane sugar, torn into fibres and the solution pressed away with filter paper; concentrated sulphuric acid is then dabbed on. Under the microscope the material then looks distinctly red if the paper was rosin sized.

Tannin reaction for detecting animal size. The paper is heated with water on the object carrier, the paper is removed and tannin solution added to the extract. If the paper was animal sized then a brownish amorphous precipitate is seen through the microscope. —Der Papier-Fabrikant.



NEW PATENTS



PULP-REDUCING APPARATUS.

By CHARLES WELLS SHARTLE, of Middletown, Ohio.

U.S. PATENT NO. 1,091,941.

This invention pertains to a system of apparatus so organized that the screening machine may run with practical continuity, notwithstanding the fact that the rough pulp tailed away from the screening machine may require to be acted upon by reducing machinery working in a discontinuous manner.

My present invention will be readily understood from the following description taken in connection with the accompanying drawings in which:—

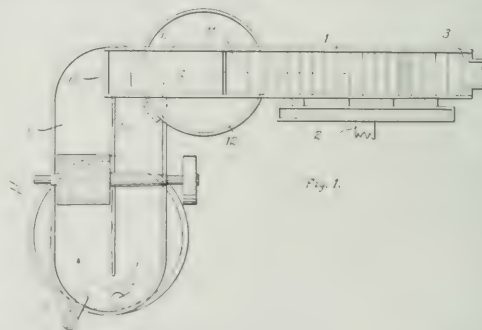
Figure 1. is a plan of a pulp-reducing apparatus exemplifying my invention, and Fig 2 is a vertical longitudinal section of the same in the plane of line a of Fig 1.

In the drawings:—1, indicates a pulp-screening machine of usual type; 2, the outlet therefrom for the pulp which is of such degree of fineness as to have passed through the screen-plates; 3, the head of the screen, onto which is to be delivered, by any suitable means, the rough pulp of such degree of wetness as is suitable for the screening operation; 4, the tail of the screen, onto which is to pass the rough pulp which is of such coarseness as to be unable to pass through the screen-plates; 5, an endless series of drag-blades of known construction arranged to drag the pulp over the screen-plates from the head to the tail of the screen; 6, a beating engine of known type, adapted to receive the rough pulp tailed off from the screen and, by operating upon that pulp after a proper length of time, to reduce it to proper degree of fineness, this beating engine being adapted to receive the tailings from the screen, the illustration showing the beating engine as being located upon a lower level than the screen, as on a lower floor of a mill, so that the tailings from the screen may flow to the beating engine by gravity; 7, a discharge pipe through which the beating engine may be emptied of its contents; 8, a gate in this discharge pipe; 9, a water supply pipe to deliver into the beating engine such water as may be needed in the pulp therein to fit it for proper action by the beating engine; 10, a chute adapted to deliver the tailings of the screen to the beating engine where gravity is depended upon to effect the delivery, as in the particular case illustrated; 11, a trap door in the tail of the screen between the terminal end of the screen and the terminal end of screen tail 4, this trap door being preferably located very near the terminal end of the screen; 12, a tank disposed between trap door 11 and the beating engine and having preferably a volume considerably in excess of that of the beating engine, and 13, a valve disposed at the base of the tank and adapted to permit the discharge of the contents of the tank or a portion thereof into the beating engine.

In the operation of the apparatus, in the particular form illustrated, the rough pulp of proper wetness, passing the head of the screen and is dragged over the same by the drag-blades. Pulp of proper fineness

passes through the screen-plates and out through the outlet 2, for utilization or for further treatment if need be. Trap door 11 being closed, the drag-blades drag tailward, the pulp too coarse to pass through the screen-plates, this coarse stuff passing off of the tail and thence into the beating engine through chute 10. As the pulp, in passing over the screen has not only parted with much of the finely reduced pulp, but also a large quantity of the water carried by the pulp delivered to the screen, the pulp delivered to the beating engine is not sufficiently wet for beating operation. To make up for this deficiency a proper amount of water is admitted to the beating engine through supply pipe 9 and the described operation is continued until the beating engine is properly filled, it being understood, of course, that the beating engine is in motion and exercising its reducing function upon the pulp while the pulp is being delivered into it.

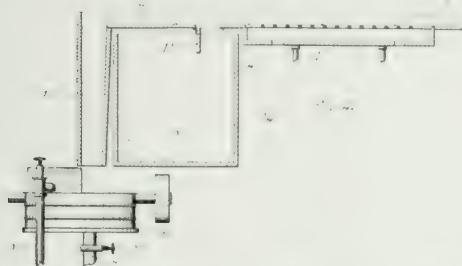
The beating engine having been properly filled with pulp and properly supplied with water, trap door 11 is to be opened, whereas the pulp tailed from the screen,



goes into tank 13 instead of into the beating engine, it being understood that valve 13 is closed. The beating engine operates upon the pulp within it until the same is reduced to the proper degree of fineness whereupon gate 8 is to be opened, and the reduced pulp discharged through pipe 7 to some proper point for utilization or for further treatment if need be. In the meantime the screen has been tailing into the tank, and when the beating engine has been emptied and gate 8 again closed, then valve 13 is to be opened and the contents of the tank or a sufficient quantity of the contents go into the beating engine to be acted upon by it in the same manner as it acted upon the tailings received by it directly from the screen. If there is a sufficient quantity of pulp within the tank to properly fill the beating engine then, after the transfer, valve 13 may be closed and the tailings from the screen may continue to go to the tank through the trap door. If there be an insufficient quantity of pulp in the tank to properly fill the beating engine then the quantity in the beating engine may be added to by tailings passing through the trap door and through the tank or, the trap door being closed, by tailings going to the beating engine through chute 10, or, in case of an insufficiency

of pulp in the tank, the trap door may be closed and the beating engine may receive pulp simultaneously from the tank and from chute 10.

It will be apparent from the foregoing description that my invention consists in interposing between the screen and the beating engine or reducing mechanism a storage receptacle and in providing means for interrupting the discharge of the screen directly to the beating engine and causing the same to discharge into said storage receptacle, and further providing the storage receptacle with means for causing the desired portion of its contents to be discharged into the beating receptacle, thus enabling the screen to be operated continuously regardless of the amount of material being fed over the same. If there is but a small amount of waste or coarse material being discharged from the screen, which can be taken care of by the beating engine, the



screen is allowed to discharge directly to the beating engine. However, if the amount of coarse material is such as to exceed the capacity of the beating engine it is discharged into the storage receptacle and thence into the beating engine when the latter is ready to receive it. In this manner the screen operates continuously and where the amount of coarse material is sufficient the beating engine can operate at its full capacity practically continuously because as soon as it has been emptied it can immediately be refilled from the storage receptacle without waiting for the slower process of filling it directly from the screen.

I wish it to be understood that I do not desire to be limited to the details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

ROTARY SUCTION-ROLL OR VACUUM COUCH-ROLL FOR USE IN PAPER-MAKING MACHINES.

By ROBERT MARX, of London, England.

U.S. PATENT NO. 1,091,899.

This invention relates to improvements in or applicable to rotary suction rolls or vacuum couch rolls for use in paper making machines.

An object of the invention is to mount a stationary suction box having an open top within a perforated drum or cylinder in such a way that said box is immovable radially of said cylinder and nevertheless an effective airtight joint is afforded between the interior of said cylinder and the edges bounding said open top.

Further objects are to provide antifricition bearings if desired of a more or less fluid tight nature between

said drum and said box, to improve the construction and arrangement of members which produce said airtight joint between said drum and suction box, and generally to provide an apparatus in which the suction box is prevented from being drawn against the drum so that any wear comes upon the jointmaking members and is distributed over a considerable area, the result being that less driving power is required, the vacuum is more efficiently maintained, the wear parts are renewable in a simple manner and at low cost, and the power consumption by the pumps and the machine is considerably reduced.

In the drawings, Fig 1 is a central longitudinal section of an improved suction roll machine. Fig 2 is a transverse section. Fig 3 is a longitudinal sectional view of a bearing detail to a larger scale. Fig 4 is a more or less diagrammatic plan view of the arrangement of packing members. Fig 5 is partly an end elevation and partly a transverse section of one end packing member and its holder. Fig 6 is a section at right angles to the section in Fig. 5 and Fig. 7 is a plan section taken on the line VII-VIII of Fig. 5.

Referring to the drawings, a, are suitable standards or supports, and fixedly connected thereto, are hollow trunnions b, which form extensions of the central suction box c.

d is a rotary drum mounted on the trunnions b in the manner hereinafter described.

The suction box c is provided with an aperture e which communicates with the suction chamber proper, and f is a suction connection at the end of one of the hollow trunnions b for exhausting the air from the suction chamber through the suction box. The ends of the hollow trunnions are hermetically sealed by disks g, and these trunnions may be fixed in the supports by means of the set screws h, so as to permit the adjustment of the suction box to meet the various requirements. The sides of the suction box are formed by a plurality of longitudinally extending bars which are seated in chambers m, as clearly shown in Fig. 2. These bars may be made in one piece, but I prefer to form them of a plurality of pieces, as illustrated in the drawings. Each of these members comprises the upper strip, j, which is arranged to engage the inner periphery of the drum, and which is secured to a ram k, so that the centre bar is moveable in a vertical direction in the chamber m to hold the upper face thereof in contact with the inner periphery of the drum. The end members extend from bar to bar, and from the bottom of the suction chamber to a point adjacent to the inner periphery of the drum. Each of these end members comprises a holder p the full width of the suction chamber, and which is provided with a transverse groove, as clearly shown in Fig 1. Movable in this groove is a slider v, which is normally held in its upper position by means of a plurality of springs w, seated in openings in the bottom of the holder, which bear against the bottom of the groove in the holder. Seated within this groove above the slider v, is a packing member k, which extends from side bar to side bar, and is held in contact with the inner periphery of the drum d by means of the spring w, which holds the slider in its elevated position. These packing strips k may be of inverted U-shape in cross section, the limbs of the U extending downwardly and rest on the slider v in the groove in the holder p.

Connected to the lower end of each of the end members, is a longitudinally extending leather packing, which is arranged to form a tight joint between the sides of the chamber m and the members forming the sides of the box. Water under pressure is admitted to

the spaces beneath these packing members a through a pipe n to hold the side members in their elevated position.

It will readily be understood from the foregoing description that the side members engage the end members throughout the entire height of the side members, which will avoid any leakage between the side and end members. The packing strips k prevent leakage between the end members and the inner periphery of the drum, and as the side members are held in contact with the inner periphery of the drum by means of hydraulic pressure, an air-tight joint will be formed between the drum and the side members.

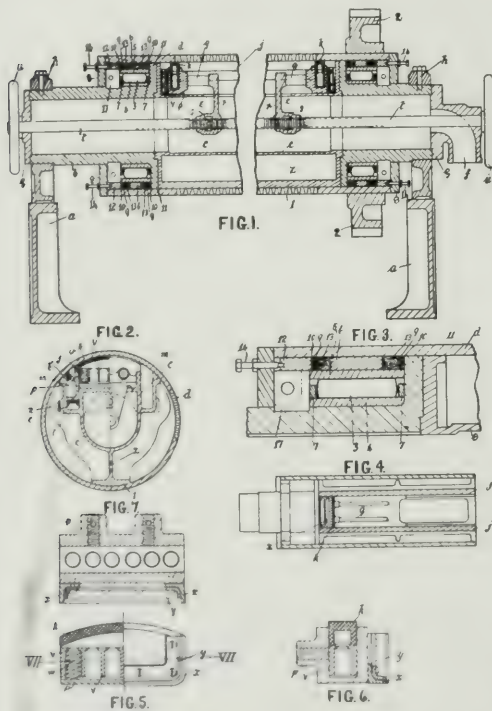
Packing leathers x are fitted along the side and bottom edges of the holders p, being fixed thereon by the angle bars y, and having for their purpose to prevent leakage of water or air past such holders into the vacuum or suction box c. At a point diametrically opposite its aperture e, the suction box c is formed with a web or support z carrying a foot piece 1, the lower surface of which is part-cylindrical to fit the interior surface of the drum d.

iron ring 17, which is interposed between the cover ring 8 and the bearing parts. Rings 9 are arranged to turn with the casing 5, and similar rings 10 are arranged between the inner rings 9 and the flanges 11 on the trunnions and also between the outer rings 9 and sliding rings 12. In the spaces between the ends of the rings 6 and the rings 9 are inserted rolls 13 of sheet asbestos impregnated or covered with rubber and well greased, or any other suitable packing material, and it will be seen that by screwing up the bolts 14 the rings 12 will be forced inwardly in the axial direction, thereby compressing the rolls 13 and causing them to make a tight joint between the drum d and the casing 5. At the same time the axial pressure due to the screwing up of the bolts 14 does not set up undue friction owing to the presence of the rings 9 and 10, which rub against one another and take the wear, as well as preventing binding of the drum to the stationary parts as might happen in the absence of these rings 9 and 10.

It will be seen that in an apparatus fitted with these improvements, the fluid tight sliding joint between the drum d and the suction box c is quite independent of the atmospheric pressure which in previous machines of this type, was utilized to force these parts together when a vacuum was set up in the suction box c. Consequently, heretofore, if a high degree of vacuum were employed the suction box and drum were held together so tightly that the drum became practically inoperative. In other cases the high vacuum could not be maintained owing to faulty packing arrangements. Now in the improved arrangement the suction box c is absolutely prevented from moving out of concentricity with the drum d and the formation of the fluid tight sliding joint is entirely due to the operation of the packing strips and bars j k, consequently the degree of vacuum employed may be as high as it is possible to obtain and nevertheless the power required for driving is reduced. In addition, the drying action is increased by the higher degree of vacuum which can and may now be employed.

It must be pointed out that it is important to provide means for preventing leakage between the holders p and the drum c and between the longitudinal packing strips k and their holders p. Reference to Figs. 2 and 4 will show that the ends of the strips k fit nicely against the strips j to press tightly against the interior of the j by the rams l, not only causes the upper edges of the strips j to press tightly against the interior of the drum, but owing to the engagement of the curved surfaces of the strips j and drum d, there may be a tendency for the strips j to move laterally a little and to tightly press against the ends of the strips k. When the transverse packing strips k are moved towards one another from the position seen in Fig. 1, it will be noticed that the water and air have access to the spaces on the outer sides of the strips k and their holders p through the side perforations in the drum. In these circumstances the packing leathers x, which extend down the sides and along the bottom of the holder p, prevent such water and air from leaking past the holder into the suction box c.

The roller bearing which preserves the concentricity of the drum d with the trunnions b and also facilitates the movement of the drum, is protected against the entry of water or liquor by the rolls of packing material 13 heretofore described and the tightness of the packing can be adjusted as desired through the agency of the adjusting screws 14 and the axially slidable rings 12 and 6.



The drum d, which is driven for example by the toothed ring 2 shank or otherwise fixed therein, runs upon the antifriction bearings around the trunnions b. Such bearings may comprise rollers 3 running upon and slidable 4 fixed on the trunnions b and within a steel casing or housing 5 which is connected with the drum d by a ring 6 rotatably of cast iron, which is slidable between the drum d and casing 5 but is non-rotatable in relation therewith. The rollers 3 run between the slidable rings 7, and the assembled parts of the bearings are secured in place by a divided cast

The invention is not confined to the use of a suction box of the particular cross section described, as other known forms can be substituted without departing from the invention.

The arrangement comprising hydraulic devices for forcing the longitudinal packing bars *j* upwards and springs for forcing the transverse strips or bars *k* upwards, offers many practical advantages. The longitudinal bars being of great length require to be pressed upwards with uniform effect is attained by hydraulic means which are readily applied owing to the holders of the longitudinal strips or bars *j* being relatively immovable. As the transverse bars or strips *k* are comparatively short, springs are effectively applied for operating upon such bars and, as the holders *p* are slidable, the use of springs obviates any difficulty which might be encountered in supplying hydraulic pressure to such slidable holders *p*.

The direct contact between the transverse packing members and the longitudinal strips is important for various reasons. Heretofore it was proposed to guide the longitudinal strips between fixed walls both of which extended substantially to the inner face of the perforated drum, but which necessarily were slightly spaced from said drum, in order to afford necessary clearance. The transverse packing members operated against the inner faces of the inner walls.

As a result there was a material amount of leakage over the edges of the inner guide walls and apparently eddy currents were formed which at the take-off point of the roll caused variations in suction and consequent change of the take-off point. This was apt to cause the breakage of the sheet and at times non-uniform drying. By having direct contact between the transverse packing members and the longitudinal strips, the available suction with the consequent breaking of the sheet is eliminated. Furthermore, the efficiency of the apparatus is increased and the useless leaking of air into the suction box is diminished.

MANUFACTURE OF PAPER SUITABLE FOR SECURITY CHECKS.

Menzies and Aitken, of Musselburgh, Scotland,
Patentee.

U. S. Patent No. 1, 086,386.

This invention relates to improvements in the art of producing paper suitable for security checks, stamps and other documents, by incorporating in the paper pulp in the process of manufacture of paper, or impregnating the partially or completely manufactured paper with, a compound of such nature that when the paper so treated is written or printed on with ordinary ink a reaction will take place as a result of which the color of the ink will be indelibly morlandated in the fibers of the paper.

According to the invention, there is incorporated in the paper pulp, or the partially or completely manufactured paper is impregnated with, a soluble thiocyanate, preferably thiocyanate of ammonium, and a soluble salt of lead, desirably in such proportions that the insoluble thiocyanate of lead produced by the combination, will amount to 5 to 20 per cent of the weight of the paper more or less; or there may be added directly to the pulp or paper thiocyanate of lead, desirably in the proportion of 5 to 20 per cent of the weight of the paper 35 more or less.

DECISION IN LUMBER CO. CASE

The decision handed down in the Court of Appeals in the case of the Northern Crown Bank against the Great West Lumber Co. was in favor of the Bank, the Court being unanimous in its finding and full costs for the proceedings throughout were awarded to the Bank.

The case involved a sum of approximately \$60,000. The action arose through the denial on the part of the lumber company of its liabilities. Large advances were made to this company by the bank a number of years ago. When these advances had reached a certain sum the bank, it is alleged, took an active part in conduct of the business. It was urged that the control the bank exerted became so large that the lumber company was relieved from the responsibility for any losses which might have been incurred.

On the first trial Chief Justice Harvey gave a decision in favor of the lumber company. This decision is now unanimously reversed by the full court.



JOHN R. BOOTH

Canada's Veteran Papermaker, who celebrated his
87th Birthday on April 7th

John Martin of the John Martin Paper Co., of Winnipeg, who have branches in Calgary, Regina and Edmonton, was in Toronto and Montreal last week. Mr. and Mrs. Martin have been spending some time in Indiana, and also visited New York and other eastern cities. Business in the west is improving in the paper line, and the outlook for the coming season is good, according to Mr. Martin who, during the last three years, has built up a very large trade in all lines of paper.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

London, April 2, 1914.

Edward Lloyd Ltd.

The coating paper mill of Messrs. A. E. Reed & Co., Ltd., at Maidstone, in Kent, one of eight owned by the same firm, which was burnt down in August 1913, has been entirely rebuilt. The mill had two machines, and was run by steam. Now electricity has been resorted to, and the mill is one of the finest and most up-to-date structures any paper man could lay eyes on. The whole of the motors and controlling appliances have been supplied by a well-known English house with a high reputation. All the motors have a speed variation of from 500 to 1,200 R.P.M., thereby giving complete control over the drying process for the paper. The original method of driving was by belt transmission from the main engine, by which means it was impossible to get the proper speed at the various changes of the atmosphere for drying the paper. The electrical installation is giving great satisfaction to Messrs. Reed, both in utility and running cost, the saving of the cost of large belts being a marked feature in the adoption of electrical power. Messrs. Reed are one of the go-ahead firms in England and Canada, and the head of the firm is recognized as one of the best practical manufacturers of paper in Great Britain. His vast knowledge of mill work has compelled him to adopt electricity, and the future of the mill at Maidstone—known as Bridge Mill—will be watched with the keenest interest.

Scottish Wood Pulp.

In the United Kingdom recently a good deal of attention has been given to the question of re-afforestation and forests, so much so that the government has given grants to help on the movement. Short references to these grants have appeared already in the Pulp and Paper Magazine. The subject has now been taken up by Mr. Thomas Tait of Messrs. Thomas Tait & Sons, Ltd., Inverurie paper mills, in Scotland, who has written a letter to the Aberdeen "Free Press" in which he says that his family reclaimed 117 acres, also planting a part of the unreclaimed, and the balance he has just completed planting, with the help and advice of the University authorities and the Royal Agricultural Society. Of the planted portion, says Mr. Tait, it is interesting to note that from the spruce already matured his firm had made excellent pulp and paper, and they have also made trials from forests on Donside. He forwarded a specimen of the paper to the "Free Press" and the editor of that journal says the paper which was made 16 years ago, from wood grown on the Castle Forbes estate, is white and sharp, and crisp to the touch, as if it had come from the mill yesterday. It shows that there can be no question whatever about the quality of wood pulp produced in Scotland. It is excellent in composition, and all that is needed is that the supply be made according to quantity. Messrs. Tait & Sons are the sole pulp makers in Scotland, and they are deeply interested in the question of re-afforestation, being of the opinion that if the subject is handled in the right way with the assistance of the University, soon the paper industry may flourish thereby.

Considering the dullness of the paper industry during the latter part of 1913, a most remarkable feature of the annual report for last year issued by Edward Lloyd, Limited, is the considerably larger profits secured, when the results are compared with 1912. The increase is attributed to the more active demand for every description of paper throughout the world and an increased production of pulp and paper at the company's different mills. They also say that economies in manufacturing have compensated to some extent for the present low selling price of the finished product. Profits rose from £140,337 to £152,362, an increase of £12,025, and as the much larger balance of £23,629 was brought down, the total is £175,992 in comparison with £156,729. To reserve £20,000 is again placed, and after paying the Preference dividend the total distribution on the Ordinary shares is raised from 10 per cent to 11¼ per cent, while the balance brought forward is substantially increased to £41,498. The report says there now appears to be some slackening in the requirements of most countries, and shareholders must be prepared for some diminution of activity of trade in 1914. With the addition mentioned the reserve account will stand at £60,000, while investments in the balance-sheet amount to £98,455, so that the financial position of Edward Lloyd, Ltd., is a remarkably strong one. Two features of this company Canadians would do well to take a note of—one is the company's investments and the other is the company's pension fund.

John Dickinson & Co., Ltd.

The report of John Dickinson & Co., Ltd., paper makers and wholesale stationers, makes the bald statement that "after making the usual depreciation and providing for interest on debenture stock and preference stocks, the net profit amounts to £87,794, as compared with £99,471 last year," and does not indicate what appropriations are to be made, or the rate of dividend to be paid on the ordinary shares. Even this information, slight though it is, is a great improvement on the previous report, when not even the amount of profit realized was made known, the balance sheet showing one item of "sundry reserves and profits." It is stated with regard to the past year, that despite the fall in profit, the total sales were again increased in the face of increased competition and enhanced cost of materials. The principal reduction in profit occurred at the Croxley paper mills, owing to the employment of a number of new workers inexperienced with the methods and machinery of the mill, on the introduction of three shifts instead of two, an unexpected increase in waste occurred, in addition to the increased wages. It has been found necessary, therefore, to revert to the two shifts system. Serious delays have also occurred in the delivery of the new boilers, so that the electric power plant, on which a considerable amount of capital has been expended, is not yet in operation, but it is anticipated to be working by the middle of this year. The change back from the three shifts to two shifts shows that the experiment, which was only on trial, has proved a failure and should put a stop to all the talk we hear lately about the three shift system.

Deal in Irish Paper Mills.

Mr. F. Becker, of Messrs. Becker & Co., Ltd., London, and Mr. Neil Turner, also of London, were defendants in a case, heard in the Chancery Courts, in which Mr. Isaac Nathaniel Lyons sought a declaration that he was entitled to one-third of the profits made or to be made directly or indirectly, as shareholders in any company or otherwise by the defendants or other of them by reason of the purchase, sale or dealings in certain mills in Ireland. He also sought an injunction to restrain the defendants from parting with such profits, or, alternatively, a claim for remuneration on a quantum meruit basis. The plaintiff was interested in negotiating sales of properties, and was acquainted with a director of Kynochs, who owned paper mills in Ireland, and for which the plaintiff was authorised to find a purchaser. He introduced the subject to Mr. Becker and Mr. Turner, upon the terms that they should purchase and that any profit they made should be divided between the three of them. After the purchase had been made the plaintiff learned that Mr. Becker had caused the Irish Development Company, Ltd., to be formed, and that he was dealing with the matter unsatisfactory to the plaintiff. The judge dismissed the case and said the plaintiff's claim was for profits which other people had to work for at their own risk. The plaintiff had no legal claim whatever. At present there had been no profit except the profit on the resale, and he thought the claim of the plaintiff was absurd. Defendants repudiated the contract and were not called upon to answer the case.

Machinery for Experiments.

The government of the Federated Malay States have placed an order for a complete plant for investigating fibres with Messrs. T. J. Marshall & Co., Ltd., Stoke Newington, London. Amongst the fibres to be tested for paper making will be hedychium coronarium. The plant, which will be delivered in June, comprises a cylinder mould machine with strainer complete, small vertical boiler, revolving boiler, kollergang, beating engine, electric motor, etc., all calculated on the basis of 28 lbs. dry weight of material. The same firm has also received an order from the Imperial Institute, South Kensington, London, for one small beater, and a set of hand-moulds. The Institute is experimenting with elephant grass from Uganda, Nilotic payrus and Hedychium Coronarium with a view to ascertaining their qualities for papermaking.

Bergvik Co., Ltd.

The directors of the Bergvik Co., Ltd., pulp makers, announce a dividend of 12 per cent on the deferred shares for the past half year, making 15 per cent for the year. Mr. Curtis, president of the company, at the annual meeting said that the average selling price of pulp during the last year was better than in the previous year. For 1914 they had already sold almost the whole of their output. During the last six months business in England had been very quiet, but their sales had been satisfactory on the continent and in America. He saw no reason why the price of pulp should fall. There were very few mills being put up in Scandinavia and from reports he had received building in Canada was not excessive. The future difficulty of pulp mills appeared to be where to get their pulp logs, but fortunately in their own case they had a large area of free-

hold forest. The production of alcohol as a by-product at their mill had shown satisfactory results, although there was not the demand for it that was expected.

New Use for China Clay.

China clay is to be used more in the manufacture of soap, and the news should be good for clay producers in Canada. Fats used in soapmaking cost about \$120 a ton, whereas China clay can be bought from \$4 to \$6 a ton. The information has caused much satisfaction in Cornwall china clay circles, but from a papermakers point of view, the news is not very encouraging, because the demand at present exceeds the supply, and if soapmakers get into market it is greatly to be feared that clay prices will make a considerable jump. America will feel the pinch greater than the English paper manufacturers, but Canada will not be materially affected. Besides, Canada has clay mines of her own to fall back on. The new discoveries made are up to the present kept a trade secret, but it is known that soapmakers have used china clay for some time past. China clay is now used in pottery, papermaking and soapmaking. What will be the next turn?

Paper Making in Wales.

Rather disappointing results are shown by Thomas Owen & Company, the Cardiff paper manufacturers, in their report for the past year. This is attributed mainly to the labor troubles at their Hjerpen works, which resulted in a three months' strike. The net profits, after deduction of debenture interest, depreciation, etc., amounted to £5,800 as against £15,800 in the previous twelve months. A dividend of 3 per cent on the preference shares is announced, leaving a balance of £700 to be carried forward. Nothing is added to the general reserve fund to which there was an addition of £3,000 in 1912. Messrs. Owen are big producers of news-

Mr. Dubuc in London.

Mr. Dubuc of the Chicoutimi Pulp Company is on a business visit in London, and has spent a good deal of time with his agents, Messrs. Becker & Co., Ltd. It will be remembered that some time ago the Chicoutimi Company entered into some very big contracts for the supply of pulp in England. Mr. Dubuc's friends on this side were glad to see him—this is his second visit inside 18 months—and no doubt on his return to the Dominion he will have some good news to announce for the information of Canadians. Indeed, it would do no harm if Canadian pulp men would visit London more frequently and personally pick up some of the contracts that are given away to other sources.

CHICOUTIMI LUMBER & PULP CO.

New financial arrangements have been completed in London by Mr. J. E. A. Dubuc for the Chicoutimi Lumber and Pulp Co., and the concern will shortly undertake extensions to its plant in the Lake St. John district, involving an expenditure of approximately \$4,000,000.

To provide for the new financing the company last November ratified a scheme for the conversion of its 5 per cent. bonds into 6 per cent. bonds. Later the company took out supplementary letters patent at Ottawa increasing its capital stock from \$1,000,000 to \$7,500,000 and provision was made for issuing preference shares in a £1 denomination.

PULP AND PAPER NEWS

The lumber season was a good one in the Ontario woods during the past winter. Figures have been compiled by the Department of Lands, Forest and Mines showing that the cut of pulp wood was 225,250 cords; pine 350,000,000 feet board measurement; spruce, 7,500,000, hemlock 35,000,000 feet, other varieties of timber 75,000,000; hard wood (beach and maple) 5,000,000; charcoal wood, 60,000 cords; railway ties, 5,500,000. The total figures was 472,500,000 feet, board measurement.

Recently the Associated Boards of Trade of Ontario waited upon the Ontario Government and presented resolutions passed at the annual meeting of the Association held in Toronto. One of the requests was for the appointment of a provincial fire marshal, with a view of preventing fires as far as possible and keeping buildings free as far as can be from dangerous substances. The Ontario Government will establish such a department and there will be a fire marshal, with a staff of deputies, who will be fully equipped to investigate all questionable fires and take all possible steps to prevent the great waste therefrom. The insurance companies will bear the expense of the department and the province will not be put to any outlay in connection with the department. The insurance fund will be provided by a tax of one third of one per cent of the gross premiums received by the insurance corporations on all business transacted in Ontario during the previous year. Chief Ten Eyck of the Hamilton Fire Department is mentioned as a likely appointee for the position of Fire Marshall.

Thomas Gain, sales manager of the Don Valley Paper Co., Toronto, who recently completed his thirty-sixth anniversary in connection with the paper trade, was one of the first salesmen in that line to ever visit Winnipeg and the West. His initial trip to the Prairie capital was made, over twenty-seven years ago, via Chicago before the C.P.R. was completed. In those early days the traveller could not do business and get away in a day or two as at present. He was compelled to hang around three or four weeks and to make several calls, many of them of a social nature, before he could secure his full allotment of orders. After a number of trips Mr. Gain was able to cut down the time to fifteen days. He was then with the Lincoln Paper Co., of St. Catharines, serving that firm nineteen years and opening up their Toronto branch.

The annual meeting of the Pacific Pulp Co. was held in Toronto last week. The annual statement showed earnings for 1913 to be \$73,568 as against \$79,669 in 1912. The usual dividends were paid, and the sum of \$36,000 carried forward to profit and loss as against \$32,400 in the previous year.

A meeting of the hemlock lumbermen was held in Toronto last week. There is said to be a great demand for hemlock among the dealers. During the past winter there has rather more snow than usual in the bush, and the reports that the logs are tied up and that there will be a shortage in this class of lumber is denied. Toronto lumbermen say that they do not anticipate an

advance in the price at present and the trade outlook is very good.

The apparent indifference of manufacturers in the Old Country towards Canadian import trade has prompted the Canadian Chamber of Commerce in London, Eng., to establish a British Manufacturers' section. Nearly one hundred firms, among them some of the most prominent paper houses, have joined the section, and it has been decided to take collective action immediately to capture a larger portion of the import trade in the Dominion of manufactured goods. Another matter, which will receive early consideration, will be the Canadian transportation problem taking into consideration the freight position as it will exist consequent upon the working of the Panama Canal.

Fibre shipping cases, the first of the kind produced in Canada, are now being manufactured by the Canada Paper Box Company, Cote Street, Montreal, who have installed a large plant for this purpose.

The Hinde and Dauch Paper Co., of Canada are now manufacturing sanitary corrugated boxes for shipping bread, etc., at their factory in Toronto. They point out, that when in camp the Canadian Militia demands that corrugated boxes be used for the shipment of bread. A number of Toronto bakers are now using these boxes which keep the loaves fresh and dust proof.

H. B. Hart, managing director of the British American Wax Paper Co., Toronto, is at present in England. He recently lost his father and while abroad will attend to various business matters in connection with the estate.

After a week's illness from pneumonia, W. B. Newsome died recently in Toronto. He was born in Charlottetown, P.E.I., in 1849, and for over thirty-five years carried on an extensive business as a law stationer in Toronto.

A special meeting of the Canadian Manufacturers' Association was held in Toronto last week at which the Workmen's Compensation Bill, now before the Ontario Legislature, was discussed, and steps will be taken to place the objections of the Manufacturers to certain principles of the bill before the Ontario Government. The form in which the specific protests will be presented is being drafted.

In a recent address before the Canadian Institute, Toronto, on "Fire Protection for Forest Reserves," Dean Fernow of the Faculty of Forestry of Toronto University, said that in comparison with British Columbia, the fire protection of the wooded wealth of the provinces was not as efficient, although the protection in connection with the forest reserves of Ontario was very good. He also stated that the United States has over twice the timber area of Canada.

George Pauline, who represents Robert Fletcher and Sons, Manchester, Eng., manufacturers of tissue, bond and other papers, was in Montreal, Toronto and other places on business this week.

C. H. L. Jones, manager of the Lake Superior Paper Co., has been appointed assistant to W. E. Stavert, President of the Spanish River Pulp and Paper Mills, Limited, with headquarters at Sault Ste. Marie, where the

offices of the President are now located. The purchasing and operating departments of the Company are now conducted at the Soo, and all business in these branches transacted at that point. The offices of T. H. Watson, Vice-President, and John G. Sutherland, sales and traffic mananer, remain in Toronto.

The Toronto Paper Manufacturing Co.'s mill at Cornwall, which has been closed down for some time owing to the government building new concrete retaining walls at Locks 17 and 20, will start operations again on April 20. In the meantime the plant has been given a thorough overhauling.

The eight-column wide newspaper seems to be gaining in popularity and recently the Toronto Telegram, the Toronto News and other papers of the province have been enlarged in size from seven to eight column sheets.

The area of Algonquin Park is being increased by the Ontario Government from 2,741 square miles to 3,047 square miles by the acquisition of 306 square miles of limits from the Pembroke Lumber Co., at a cost of \$185,000. The object of the purchase is to promote reforestation and to retain the timber for future use.

The Barber mill of the St. Lawrence Paper Mills, at Georgetown, Ont., is being electrically equipped so that the beaters, Jordan engines, etc., will be run by motors.

John R. Barber, President of the Barber-Ellis Co., who for many years had his office in the Mail and Empire Building, Toronto, until he disposed of all his interests in the various paper manufacturing companies with which he was identified, has so far recovered his health as to be a frequent visitor to Toronto, and now has an office at the Barber-Ellis warehouse.

The Lansdowne Lumber Co., of Toronto, which was organized in 1912 with a capital of \$40,000, recently made an assignment to J. P. Langley, Toronto. The liabilities are about \$10,000. Peter Thompson is the President of the Company, and George Mustard, Manager.

Fred Lancaster has been appointed Maritime representative of the Canada Paper Co. with headquarters at Halifax, succeeding Norman W. Latter, who was for nearly a quarter of a century in the service of the company, and passed away recently after several months' illness at the early age of thirty-seven years.

A bill has been introduced in the Ontario Legislature by Hon. W. H. Hearst, Minister of Lands, Forests, and Mines, stipulating that no license holders, corporations, etc., will be allowed in future to make campaign donations toward the election of any parliamentary candidate, and requiring all candidates to give publicity to campaign contributions.

James Logie, manager of the Toronto branch of the E. B. Eddy Co., who has been ill, is able to resume his duties.

Joseph Kilgour, President of the Canada Paper Co., who is an enthusiastic admirer and breeder of good horses, entertained a large number of his friends to a private horse show on April 11 at Sunnybrooke Farm, near Toronto. Mr. Kilgour, it will be remembered, placed his farm at the disposal of the yeomanry of York county last fall when an old-fashioned ploughing match was held for the first time in many years.

One of the largest sawmills in Northern Ontario at Tomigo Village, belonging to Ferguson and McFadden was totally destroyed by fire on April 2. The loss is estimated at over \$50,000.

The Weatherhead Paper Co., of Toronto, which recently took over the business and assets of the George Powley Paper Co., is being incorporated. The capital stock is \$40,000. It is understood that the new concern will branch out considerably and handle many new lines of paper.

W. A. Newton, Toronto, Canadian manager of the Albertson Engineering Co., of Kalamazoo, Mich., has secured a patent on a new beater and washing engine, which it is reported effects a great saving in power, and possesses many other advantages. The beater is of the revolving type.

Fire recently destroyed the cheese box factory of St. Vandervoort near Belleville, Ont., doing about two thousand dollars damage.

E. A. Ritchie, of Ritchie and Ramsay, coated paper manufacturers, New Toronto, who has been spending the past two months in the West Indies, has returned after an enjoyable outing. He was accompanied by R. L. Patterson, manager of Miller and Richard, typefounders, Toronto.

In connection with the purchase of certain timber limits of 307 square miles by the Ontario Government, in Algonquin Park for \$185,000 from the Pembroke Lumber Co., a lively attack was made on the Department of Lands, Forest and Mines in the Ontario Legislature last week. C. M. Bowman of North Bruce, contended that the timber was so scattered as to be of little commercial value, and he characterized the purchase as "loot and plunder for the benefit of political friends." He moved an amendment fixing the purchase price at \$20,000. Hon. Mr. Hearst, in a warm reply, said that the attack was most unwarranted and unfair. Nothing had been concealed, and the fullest reports had been made. The best timber cruisers in the province had gone over these limits, and checked up every acre. They estimated that the commercial value of the timber on it was at least \$300,000. An independent authority on lumbering, Charles Henderson of Sudbury, had written that he considered the estimate under rather than over the mark. "I am convinced," Mr. Hearst added, "that the province never had a better chance to secure good timber land for conservation. We are getting three hundred square miles of land for a trifle less than one dollar an acre."

OCEAN FALLS CO. AFFAIRS.

According to recent reports, it is held that the Ocean Falls Company may soon be in a position to commence operations at Cousins Inlet, B.C. The property was to be offered at auction by the debenture holders by order of the Supreme Court, which, if carried out, would have meant a considerable loss to the shareholders. It was therefore deemed advisable to make some effort to avert the sale, and accordingly Mr. Lester W. David, the first president of the company, as well as the promoter, was sent to England on behalf of the shareholders and creditors. On the day previous to the advertising sale a cablegram was received from Mr. David stating that he had been successful in forming a syndicate of Englishmen, backed by Sir Robert Perks and the Equitable Trust Company of New York. The syndicate will pay off the first and second bondholders and also all creditors in full. At the auction sale no bids were received, the auctioneer refusing to state the reserve bid. In all probability the English syndicate offer will be accepted and the plant which has never been operated will begin active work.

Balsam Fir for Pulpwood

That balsam fir, a tree which a few years ago was considered of little value, is now in demand for pulp wood, is the statement made by the Department of Agriculture in a bulletin just issued on the subject. The demand has been brought about, says the Department, by the enormous expansion of the pulp industry during the past two decades, with its present consumption of three and a quarter million cords of coniferous wood and the consequent rise in the price of spruce, the wood most in demand for paper making. In addition, the demand goes on to say, balsam has begun to take the place of spruce for rough lumber, laths and the like, as the price of the latter wood has risen.

The chief objection to the use of large amounts of balsam fir in the ground-pulp process of paper making is said to be due to the so-called pitch in the wood, which injures the felts and cylinder faces upon which the pulp is rolled out. Balsam fir does not have a resinous wood, and the material which gums up the cylinder probably comes from grinding balsam under conditions adapted to spruce wood. Yet from ten to twenty-five per cent and possibly more of balsam can be used in ground pulp without lowering the grade of the paper produced. It is known that with balsam logs left lying in water over a season this drawback practically disappears.

In chemical pulp, produced through the action of acids, these acids are known to dissolve the pitch and any amount of balsam can be used, though some claim that too much balsam in the pulp gives a paper that lacks strength, snap and character.

At the present time balsam fir furnishes about six or seven per cent of the domestic coniferous wood used by the country's pulp industry. The tree itself constitutes, numerically, about twenty per cent of the coniferous forest in northern New York and Maine, and is abundant in many parts of New Hampshire, Vermont and in the swamps of northern Michigan, northern Wisconsin and Minnesota. It readily reforests cut-over areas and attains a size suitable for pulp wood in a short time.

Under present methods of cutting, balsam fir is said to be increasing in our second-growth forests at the expense of red spruce, and with the gradual decline in the supply of the latter wood the fir will become more and more important commercially.

DIRECTORY OF PAPER MAKERS.

The 1914 issue of the Directory of Paper Makers of the United Kingdom marks the 38th annual publication of this useful compilation of information regarding the paper industry in the Old Country. The chief feature in this edition are the lists of paper makers, etc., of England and Wales, Scotland and Ireland under all the various headings carefully and arithmetically revised to date; numerous additions to the list of trade designations; actual watermarks and trade names of great value to printers, stationers, etc., and paper trade customers.

This directory is one of the most complete of its kind and all the information is so well arranged alphabetically and indexed as to be easily accessible. In addition to being a great service to the trade it contains a very complete directory of paper makers, engineers, purveyors of machinery, etc., as well as information of value to stationers, printers, etc. The directory is by Messrs. Macmillan, Singer & Co., 47 St. Mary Ave. London, E.C.

"THE MAIN DRIVE."

This interesting booklet published by the Federal Engineering Company of Montreal and Toronto contains much information relating to belts and belt driving of great value to managers, superintendents, engineers and others interested in the saving of money on belting bills. The booklet contains descriptions of the beltings manufactured by this firm and actual photographs showing them in operation under varying conditions. Also descriptions, illustrations and price lists of the belting supplies handled and general information on the ordering and care of belts. A very useful booklet for reference.

A USEFUL CATALOGUE.

The general catalogue No. 38 of the H. W. Caldwell & Son Company, Chicago and New York, manufacturers of elevating, conveying, power transmitting and general machinery, is one of the most complete references of its kind, and shows distinctly the high standard set by this firm in all its undertakings. The catalogue gives some idea of the wide variety of machinery manufactured by this firm, covering with illustrations, diagrams, tables of dimensions, etc., most of the lines placed on the market.

The plant of the H. W. Caldwell & Son Co., in Chicago, occupies an entire city block, is entirely new and of modern construction. The principal buildings consist of the main machine shop fitted for both light and heavy machine work, the sheet metal and conveyor department and a modern foundry. The power is distributed electrically from their own power plant. A separate warehouse and shipping department enables them to carry an adequate stock and ship orders promptly upon completion and without danger of confusion or mistake.

The plant is served by switch from the Chicago Junction Belt Railroad, enabling them to secure and forward cars by all railroad lines centering in Chicago, and is equipped with modern tools of every character necessary to economically produce their line of manufactures and maintain a high grade of workmanship.

The catalogue will be found valuable to mill engineers, etc.

HOW TO BUILD UP BOILER EFFICIENCY.

This book, which is in its seventh edition, written by Jos. W. Hays, combustion engineer and author of several leading works in connection with combustion and the use of coal, has rightly been called, "A Handbook of Fuel Economy." It treats the subject in 5 reels: "Why your fuel is wasted," "How your fuel is wasted," "How to 'spot' your fuel wastes," "How to stop your fuel wastes," and "How to keep the wastes stopped," which, when handled right about, answers a good many problems that are continually bewildering engineers.

The other editions of this book have met with a good reception and the present edition contains much revised matter and many additions. Very little is said relating to the theory of combustion, but the author has handled the discussion of practice with much lucidity and illustration, the effort being to show those interested how they may proceed at once to actually make a real reduction in the coal bills.

The book is published by Jos. W. Hays, Rogers Park, Chicago, Ill. Price \$1.00, postpaid.

A PERSONAL REVIEW OF ATTEMPTS TO UTILIZE VARIOUS FIBRES FOR PAPERMAKING

By CLAYTON BEADLE.

We all know what was done or attempted one hundred years ago and more. It has been referred to over and over again in historical books on papermaking. These various attempts only show from time to time the dearth of sufficient raw material to cope with the world's ever increasing demands.

My first attempt to make use of any kind of new raw material was about 1885-6 when straw pulp was made at Dartford by the Leuning process and used at various mills in the neighborhood. Among other mills, it came to those of Messrs. Wm. Joynson & Son. It did not come at that time in the form of bales but in compressed masses. I rather fancy it was carted over a distance of about 8 miles and dumped down in a loose condition. I am inclined to think that the price of the bleached pulp was somewhere in the neighborhood of £24 a ton dry. It was treated by a chlorinating process, the details of which I have forgotten. The process was abandoned because it did not pay. It soon became realized that straw could not be economically treated in this country. The straw pulp has to come from abroad.

A few years subsequent to that, straw pulp again came on the English market in the form of rolls, generally in a moist condition. It was at that time very much subject to mildew. Here and there, there were black patches of mildew. I have known as much as 25 per cent soluble matter as the result of mildew and putrefactive changes taking place in bleached straw pulp. The aqueous extract from such pulp showed the presence of a large proportion of sugary or dextrine-like bodies. Of course such pulp had to be re-bleached.

It was in 1887, the Jubilee year, when my father and brother visited America and my father was very much struck with the enormous wastage of cotton seed hulls which had to be got rid of by burning under the boilers, that he shipped 10 tons over to Joynson's mills and I was put in charge of the experiments. I have, I think, two or three notebooks full of experimental work on this product. The cotton seed hulls did not contain more than about 25 per cent of actual cotton. We ran several lots over a paper machine and actually measured the yield of paper from a given tonnage of the stuff. I have a book of samples showing the different trials made from the cotton seed hulls, good, bad and indifferent. Of course, it was an impossible thing to treat hulls in this way, but I devised a process of wet mechanical separation. After boiling and washing, the hulls became loosened from the cotton and, by passing the hulls suspended in water down a V shaped trough with a slot at the bottom, so as to allow the hulls to drop through the bottom, and by causing air to bubble underneath the hulls, the cotton was kept on the top of the water by means of the bubbles of air ascending and the heavy particles of hull fell down and passed through. This is nothing more than a matter of interest because the whole idea of treating the hulls is a mistake.

About ten years ago I had a long talk with Sir Edward Partington on the subject of the treatment of hulls and he related to me his experience. I forget the details of it, but he informed me that he treated very large quantities of hulls and he had somehow or other

got a process of wet mechanical separation of the husk. I think it was by treating it in a hollander or a breaker, the bottom of which was provided with gratings so that the separated husk could fall through and the cotton fibre remain suspended. It was the same idea only in a much more practical way.

We all know the subsequent history of cotton seed cotton; how that by a dry mechanical process of separation it has become not only a feasible proposition but bids to become a very large industry. We now see how entirely we were on a false track in the methods that we then employed, the fatal mistake being to attempt to treat the whole hulls by any chemical process. It was not until some dry mechanical separation process was devised that it became a feasible proposition to utilize the material for papermaking. Now it is a first class product.

About 1886 the Indian & Colonial Exhibition was held. Many people, I expect, are now not even acquainted with the existence of such an exhibition, and few would be acquainted with the importance of the work that was done. I was at the time with Messrs. Wm. Joynson & Son, and my cousin Mr. Edmund H. Joynson, in company with Mr. Cross and myself, came to London and attended one of the conferences held on the subject of examining and reporting upon the various fibres which were submitted from different parts of the British Empire. The upshot of this was that Mr. Joynson undertook to co-operate with Messrs. Cross and Bevan for the purpose of investigating any fibres which might be of service in the manufacture of paper. Mr. Joynson placed the services of his mill at the disposal of this research work and appointed me his representative to undertake the work on his behalf. He also financed the work generally, and it was really due to his initiative that the work was so thoroughly carried out, which initiative was largely supported and encouraged by Mr. Cross.

The reports were divided into two sections; one is contained in the reports of the Colonial Sections of the Exhibition, published in book form, the other paper making report is contained in a separate communication published by Spon by the authority of the Secretary of State for India on Indian Fibres and Fibrous Substances. This latter report was communicated by Messrs. C. F. Cross, C. J. Bevan and C. M. King in association with Edmund H. Joynson. I was given the bulk of the chemical work which is contained in the various tables. This work was done partly at the laboratories of Messrs. Cross and Bevan at New Court, but to a large extent at St. Mary Cray, the more practical part of it being done at the mills.

I can only say that, as the result of all this work, no new fibre was introduced to the paper trade. Some few fibres were actually put over the paper machine. I remember well one fibre, CROTOLARIA JUNCEA Summ Hemp, in one trial gave a most excellent result, in fact it was equal to linen, but other trials were made and we failed to get such an excellent result, and could not account for the uncertainty of the material. A long time afterwards (Feb. 1897) I published a description of the value of Summ Hemp for papermaking in "The Paper-Maker." At that time, although caus-

and chemicals without any allowance for labor or over-tic soda was comparatively cheap, the cost for materials head charges, ran into at least £20 a ton. The fibre could be delivered over here at £13 a ton. It was a fibre which was much more valuable for textile purposes than for papermaking. I have a book of samples of these papers at the present time. I just give that as an instance of the practical outcome of all this laborious work.

We tried such fibres as PHORMIUM TENAX (New Zealand hemp) which again is a textile fibre and too valuable to be used in the manufacture of paper. Many years afterwards I visited New Zealand and got all the information I could upon the subject of PHORMIUM TENAX, and was entirely confirmed in my opinion that it could never be brought into service as a paper making material, although it may get there, as no doubt it does, in form of waste ropes, etc.

I had to attend the conferences at the Exhibition, the other gentlemen being too busy on their other work. It was held at the offices of Dr., now Sir, George Watt, who has since been the author of that large and standard work "Economic Products of India." I remember at a meeting seeing old Mr. Routledge and hearing him expatiate upon the value of bamboo. He brought a bale of bamboo half stuff. At the same exhibition was old Mr. Lloyd of Edward Lloyd and Sons, who was looking out for new fibres. It was before the real days of wood pulp. At that time mills like Lloyds' employed esparto, rags and other materials in the manufacture of their paper. In fact they employed such materials in the manufacture of news at a considerably later date. Now such things would be unthinkable, but it just shows the changes that have taken place since that time. Everything is being overshadowed by wood.

One fibre that we had in sufficient quantities for running over a paper machine was the so-called *Porcupine grass* of Australia. It was run over the paper machine at St. Mary Cray in the presence of Sir Samuel Davenport and Mr. Scott. I was taken at the time with the qualities of this material and still have in my possession a number of samples of the papers produced at the time. Many years later, when I visited Australia, I went to see Sir Samuel Davenport and we arranged to ship more of the grass over and made further trials, but nothing finally came of it. He asked me, when at Adelaide, if I would do him a favor. I said I would do anything I could for the kindness that he had shown to me. He asked me to get up a cabinet of samples of paper making products and present them to the Museum at Adelaide. This I did on my return.

At the conferences was also Mr. Bryan Donkin, the descendant of the old historic firm of Bryan Donkin & Co. He also showed great interest in all new fibres and at his request about this time I made some trials at St. Mary Cray with some fibres which he submitted.

We used at St. Mary Cray a little beater made, with the exception perhaps of the spindle of the roll, entirely of bronze. I should like to refer to this because, although this little machine was made by Donkins near 40 years ago, and I think cost perhaps about £60 or £70, it was the most useful type of miniature beater that I have ever used. In a small beater used for experimental purposes, it is a great mistake in my opinion to put the bars in with wooden ships between the bars as is often done, unless there is a proper ring to hold them in their position. I found the most useful type of bar was all in one piece with the roll. In fact

the roll was a solid piece of bronze planed out so as to form bars. We also had, of course, small boilers to work by the sulphite or the soda process, and all the necessary paraphernalia.

There was also the treatment of Marram grass which I need not enter into here; but I remember among other things we attempted to treat Banana. We boiled it in quantity and began to put it over the paper machine. Banana is very funny stuff to handle. It works, or is liable to work very wet. It would not part with its water. The stuff came up to the couch roll in a pool and ran over the edges, however, slowly we worked the machine. Although it is allied to *HELYCHIUM* very closely botanically, it is very different in this respect, because *Hedychium*, although it has the feeling of being very wet in the beaten state, can produce papers which are very strong and parchment-like, and at the same time part with its water on the machine quite freely. Banana is wet in any sense particularly because it refuses persistently to part with its water. We were obliged to shut down the machine running on Banana and all we could get was a number of sheets produced on hard moulds. But since this time banana paper has been produced without these difficulties, at least not so much accentuated. It has not succeeded from a practical point of view and I am very doubtful whether it ever will. I could give a lot of figures of yields which would support my view in this respect, but it would take up too much space to refer to it in detail now.

Then we have the fibre Lallang. About this time, or perhaps a little later, the then Sultan of Johore granted a concession for the utilisation of Lallang for paper making. The work of exploiting the fibre was put into my hands. At that time I was a member of the firm of Cross and Bevan. We produced a brochure and a book of samples showing what could be done with the fibre, what its cost of treatment would be, etc. Nothing however came of these wonderful concessions, but the whole subject was revived by Dr. Stevens and myself in the communications we made to paper journals about four years ago. We took a renewed interest in the subject because the material was brought to our notice again as chemists to the Rubber Growers' Association. It is a pest to the rubber planter. Many thousands and perhaps hundred of thousands of pounds have been spent by the various estates in the East in eradicating Lallang and, when we showed that it was a likely material for the manufacture of paper, the idea being scouted by the rubber planters. "What do we want to have to do with a material which is nothing but a weed and which we wish to eradicate?" They would not listen to any attempts to use it, or to cut it, bale it and export it, or anything of that sort, their only interest being to get rid of it, weeding it up, burning it and destroying it. Now, however, if you will read what is taking place in the East, there is an attempt being made in government departments to re-investigate the Lallang for paper making purposes. Whether anything will come of it or not, it is difficult to say. The fibre is there in enormous quantities and it resolves itself into the same old question—it is merely a matter of £ s. d., a question of transport, baling, shipping, etc. But with the development of paper making in the East, the supply of Eastern markets, increased mills in India, Japan, China, Australasia, etc., a different complexion may be put upon the possibility of utilizing a fibre such as Lallang for the manufacture of paper.

Pulp and Paper Industry Finland, 1913

In the industrial field, work has been carried on with, on the whole, good results. As far as concerns the leading branch, the timber trade, the year has been one of exceptional prosperity. Already in 1912 the prospects were of the best, and in 1913 they were still better. The production has, by reason of good inquiry, been increased as much as possible and prices have throughout been, to say the least, fully satisfactory. According to the statistics of the Sawmill Owners' Federation the output has been as follows, in standards:

1910	420,643
1911	456,710
1912	463,975
1913	536,593

On November 1st, 1913, the percentage of the wood-goods sold was 95 per cent of the calculated production, which exceeds by about 5 per cent the already very satisfactory corresponding figure of 1912 and is decidedly higher than the corresponding figures of the previous years.

The export has during the whole year been registering very high figures, and the official statistics now at hand, covering the first eleven months of the year, are a good deal in advance of any previous figures. Up to the end of November the export quantities have been as follows, in thousand cubic metres:

Year	Unmanufactured timber, pulpwood.	Propped timber, pulpwood.	Hewn timber, timber.	Sawn timber, wood.	Fire- wood.
1910	443	1,340	230	3,020	670
1911	526	1,528	264	2,990	700
1912	462	1,612	268	3,263	911
1913	521	2,322	284	3,992	983

Especially the most valuable part of the export, viz., sawn timber, is thus indicating a total far in advance of the previous years. The increase over 1912 is not less than 700,000 cubic metres, or nearly 25 per cent. The paper trade has been enjoying a fairly good year, although not an equally good one as the sawmills. As concerns wood pulp, the prices have, on the whole, remained on about the same level as during the latter part of 1912 and can thus be described as fairly satisfactory. Of mechanical pulp the export has diminished, making for the eleven months only 29,258 tons (reduced to dry weight) as compared with 44,173 tons in 1912. This is brought about by many of the pulp mills having entered upon the production of mill boards on a larger scale. There having also been during the autumn scarcity of water in many rivers, this circumstance has also played in, several mechanical mills having been forced to materially diminish their output.

As far as concerns chemical pulp, the inquiry has been a very good one, and the prices obtained have been high ones. The export has not been over large, making up to the end of November 1913 62,018 tons, as against 69,630 tons during the corresponding period of 1912.

Finally it can be noted with satisfaction, that the export of our most valuable article in the pulp and pa-

per trade, viz. of paper, is showing good progress for the year now under review. During the first eleven months of the year the export of paper has been as follows, in thousand tons:

1910	96.6
1911	112.2
1912	117.6
1913	132.7

On the other hand, the prices obtained during 1913 have been somewhat declining.

ROSIN IN SULPHITE CELLULOSE.

Too large a percentage of sulphite cellulose causes unpleasantness and difficulties particularly when manufacturing newspaper at a high speed of the machine. Various attempts at remedies were made; the method of cooking, emptying and washing in the cellulose mill were frequently changed, but without success. As the difficulties due to rosin were greater in winter than in summer the following method was adopted.

The pulp was thoroughly washed in the digester with water of 10—20 deg. C. driven in from below by means of a powerful centrifugal pump. The requisite rinsing took place from above with hot water. In order to obtain the necessary quantity of luke-warm water the water of condensation was collected from the digesters and the cooling water from the gas-coolers and sulphur-kilns. Sufficient water of 40 deg. C. was thus obtained for washing the pulp in the digester and for diluting the pulp for its preparation.

In this manner a temperature of the washing water which remained constant summer and winter was obtained and a corresponding diminution of the disagreeable percentage of rosin. Rosin from the waste lye congeals and adheres to the fibres when the waste lye is cooled down to a certain degree before it is separated from the chemical pulp.

WILL ADOPT PROFIT-SHARING PLAN.

The Peninsular Paper Company, of Ypsilanti, Mich., inaugurated a profit-sharing plan on April 1 similar to that adopted the first of the year by the Fair Alpacas Co. of Holyoke, Mass.

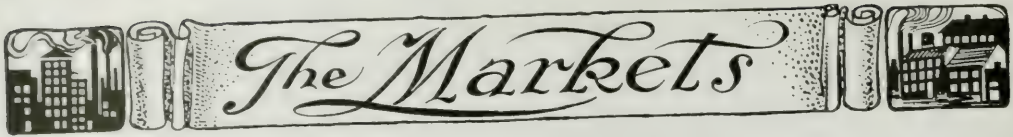
The plan is based on the equal division of dividends between capital and labor. Each man who has been employed continuously from April 1, 1914, to January 1, 1915, will receive the same per cent. dividend on his wages as is paid to stockholders on the stock of the company.

The plan is to be tried out for the period mentioned, and it is confidently expected by the officers of the company that results will justify its continuance.

A feature of the plan provides that in case of the dismissal of any employee for cause during the term mentioned, any dividend accruing on his wages for the period he has worked will not revert to the company, but will be used to establish a fund for the gradual pensioning of old and disabled employees.

The plan has the enthusiastic support of the men, who feel that the size of these dividends depends largely on their ability to avoid waste in time and materials and thus increase the earnings of the company.

As an inducement to employees for ideas to further efficiency, suggestion boxes have been placed about the mill and cash prizes offered for all suggestions adopted by the company.



Canadian Markets

The market conditions remain much the same as they have been for some time. Improvements are noted at times in certain branches of the trade, but any added business only comes in spots, and does not keep up. News print plants are well employed, and prices are ruling about the same. Book and writing mills are moving along steadily, but orders are for the most part small and necessitate frequent changes in the runs. Wrapping paper conditions are dull, and the general jobbing turnover was only moderate during the past month. Ground wood pulp is quiet, and the outlook is not exceptionally brisk, while sulphite conditions are fair, and prices govern the same as they have been for several months. All the mills have now a good supply of water, and the past winter has been favorable for the getting out of pulp wood.

The general trend in the paper and pulp lines is toward conservatism and while many new projects are under contemplation, still no great expansion in the trade will likely be evidenced until normal financial conditions are firmly established. The rag and paper stock market is fair with roofing stock showing some tendency to increase in price. Most of the lines moving in domestic rags, old papers, etc., are on contract.

There is a latent feeling in the trade that with the advent of warmer weather and after the Easter holidays are over business in many lines will show a gain.

The following quotations prevail.

News (rolls \$1.95 to \$2.00 at mill in car load lots.
News (sheet \$2.10 to \$2.20, at mill in carload lots.
News (sheet) \$2.25 to \$2.50, depending on quantity.
Book papers (carload) No. 3, 3.75c to 4.25c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (Carload) No. 2, 4.25c.
Book papers (ton lots) No. 2, 4.50c to 5.25c.
Book papers (carload) No. 1, 4.75c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 6.00c.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 7½c.
Grey Browns, \$2.00 to \$2.50.
Fibre, \$2.75 to \$3.50.
Manilla B, \$2.40 to \$3.50.
Manilla No. 2, \$2.75 to \$3.75.
Manilla No. 1, \$3.25 to \$4.25.
Englazed Kraft, \$3.75 to \$4.50.
Glazed Kraft, \$3.90 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$15.50.
Ground wood, \$21 to \$24, delivered in United States.
Sulphite (unbleached), \$41 to \$43, delivered in Canada.
Sulphite (unbleached), \$42 to \$44, delivered in United States.
Sulphite (bleached), \$56 to \$57, delivered in Canada.
Sulphite (bleached), \$56 to \$58, delivered in United States.

Paper Stock.

No. 1 bond stationery, \$1.75 to \$1.90, f.o.b. Toronto.
No. 1 soft white stationery, \$1.75.
No. 1 mail writings, 20c.
White blocks, 30c to 35c.

Ordinary ledger stock, \$1.15 to \$1.20.
Heavy ledger stock, \$1.40 to \$1.50.
No. 1 book stock, 75c.
No. 2 book stock, 45c to 50c.
No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
No. 1 print Manillas, 60c.
Folded news, 45c to 50c.
Over issues, 50c to 52½c.
No. 1 clean mixed paper, 30c.
Old white cotton, \$2.50 to \$2.75.
Thirds and blues, \$1.30 to \$1.32½.
No. 1 white shirt cuttings, \$5.00 to \$5.25.
Blue overall cuttings, \$3.50 to \$3.60.
Black overall cuttings, \$1.75.
Black linings, \$1.75.
New light flannelettes, \$4.75.
Ordinary satinets, 75c to 80c.
Flock, 90c.
Tailor rags, 70c to 80c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
No. 1 Book, 5¼c to 6c per lb.
No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
Writings, 5c to 7½c.
Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less \$3.25.
B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
Kraft, \$3.75 to \$5.00.
Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
News quality, \$41 to \$42 per ton.
Bleached sulphite, \$54 to \$59 per ton.
Kraft pulp, \$3.60 to \$4.00.
Ground woods, No. 1, \$15 to \$16.
Ground wood, No. 2, \$22 to \$24, delivered United States.

New York Markets

Office Pulp and Paper Magazine,
206 Broadway, New York.

Movement in sulphite pulp during the interval has been mainly in contract channels. Mills are fairly well supplied with orders for their output and are taking their normal consumption on contract. New business is rather quiet, but there are numerous inquiries in the city. Paper mills are confident that the values of foreign pulp will go down and are not anxious to close at current figures. Some importers also predict a downward movement. The market for domestic sulphite has been strengthened by the withdrawal of one of the large manufacturers of pulp from the source of production. The demand for sulphate and kraft pulp has been fairly good until about a week ago when there was a falling off. Some new contracts were closed at prevailing figures for long periods. The spot market has been practically dead for a week. Advices from abroad show that foreign mills are making better offers for contracts covering longer periods than for one year. Spot orders are commanding prices ranging from 1.85c to 2.00c. The market for soda is quiet.

Plentiful supplies of water have led to the grinding of large quantities of wood for mechanical pulp. Some manufacturers have already contracted for this year's output and are now making normal shipments in satisfaction of requests from mills. The spot market is not quite as active as it was but the price is still firmly maintained at \$22 to \$24 a ton. No contracts for ground wood pulp have been made for less than \$16.50 a ton at the mill. The closing of certain mills left excess supplies on hand and the grinders holding agreements with these firms offered the lots at a price somewhat below market quotations.

Domestic Rags have been in active inquiry at current values. Roofing stock has been in good demand and prices have an upward tendency. The difficulty in this market is in satisfying the demand for satinettes of all grades. Current values for roofing stock are 1.15c to 1.25c a pound for satinettes garments; 1c to 1.10c and .70c to .75c a pound for Nos. 3 and 4 respectively. The market for bagging and old rope has been uneventful during the interval, the principal feature being the softening of jute bagging. Contract importations have been normal.

All grades of old waste papers have been in good demand and prices have been firm. Soft and hard white shavings are moving briskly in contract channels at 1.80c to 1.90c and 2.40c to 2.50c a pound respectively. All kinds of flat stock command good prices and inquiries for them are numerous. The lower grades are somewhat higher in value than at the first of the year but the demand for them is a little easier as one of the largest consumers has gone out of the market. Prices have not gone to the height of a year ago. Spot orders require prompt delivery which is difficult in some cases.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.,
Ground Wood, No. 2, \$17 to \$19, delivered.
Unbleached sulphite, dom., 1.90c to 2.20c delivered.
Unbleached sulphite, imptd, 1.75c to 2c, ex dock, N.Y.
Bleached sulphite, domestic, 2.80c to 3c delivered.
Bleached sulphite, imptd, 2.60c to 3.05c ex dock, N.Y.
Easy Bleaching, impt, 2.05c to 2.20c ex dock, N.Y.
Unbleached sulphate, imported, 1.75c to 2.10c per pound, ex-dock, New York.

Bleached sulphate, impt., 2.60c to 2.80c, ex dock, N.Y.
Kraft pulp, imported, 1.80c to 2.00c, ex dock, N.Y.
Soda pulp, domestic, 2.10c to 2.25c, delivered.

Paper.

There has been a great deal of pessimism in the talk of local trade. The interval has shown a tendency to counteract the weak side of the paper market. The extreme ease in the local money market has brought about free collections. The general tendency at present is one of saving and very little investment. Travelling men in town say that mills are all running full and seem to have plenty of orders for their output. Specialty papers still dominate and enjoy a good demand. March was one of the best months in this branch of the industry. Newsprint during March moved normally. Easter advertising and special editions strengthened the market to a considerable extent and consumption on contracts is about caught up. Transient orders are plentiful at prevailing quotations. Side runs are plentiful with a rather poor demand. Current price is 2c a pound. The demand for book papers reflects no easing tendency and values in all grades are firm. Some manufacturers anticipate an increase in the price of book papers in the near future. The demand for coated grades has eased off to some extent but there has been no cutting of prices. Wrappings are quiet in demand but values in all grades are firmly maintained. Bonds, linens and ledgers are in a little better demand and prices are firm. There is an increasing demand for the medium grades of writing at prevailing figures. Krafts are not as active as they were a short time ago and values are very low. About half the tissue mills in the country have reduced the price of No. 1 white to 40c on car lots. There is little new business, however, but a fairly brisk movement along the lines of outstanding orders, most of which were made during the summer of 1913 when prices were low. Boards have been active and some manufacturers have raised the price of news board to \$31 to \$33 a ton. It is also said that the value of chip and straw board is likely to go up in the near future. Due notice and warning has been sent to certain toilet paper manufacturers who have neglected to comply with all the requirements of the Brooks net count law which became effective on February 1 of this year. The demand for these papers has been good and the value fairly firm. Paper towels and cigarette papers are in good demand at prevailing prices which are firm.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
News, sheet, \$2.25 to \$2.30 f.o.b. mill.
Book papers, car lots, C. & S. C., \$4.00 to \$4.50 f.o.b.
Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
Writing paper superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c, del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c, del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c, del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.

Manila jute, 4½¢ to 5½¢, delivered.
 Manila, wood, \$2.40 to \$3.00, delivered.
 Kraft, No. 1, \$3.50 to \$3.75 f.o.b. mill.
 Kraft, No. 2, \$3.25 to \$3.50, f.o.b. mill.
 Boxboards, news, \$30 to \$33 per ton, delivered.
 Boxboards, chip, \$28 to \$31 per ton, delivered.
 Boxboards, straw, \$28 to \$31 per ton, delivered.
 Wood pulp board, \$42.50 to \$45 per ton, delivered.
 Tissue, white, cylinder, 40¢ to 42½¢, delivered.
 Tissue, fourdrinier, 47½¢ to 50¢, delivered.
 Tissue, jute Manila, 40¢ to 42½¢, delivered.

British Markets

(Special to Pulp & Paper Magazine.)

London, April 2, 1914.

Dullness and inactivity are still predominant features of the British paper industry and agents, as well as manufacturers, are complaining bitterly of the slow state of trade. The demand for newsprint during the past two weeks has been remarkably small, and mills engaged in the production of this class of paper are receiving an unpleasant check. Wrappings are also very dull, but good quality printing paper is finding a satisfactory consuming channel in the publishing and large printing houses in London and the provinces. New business in other kinds of papers is limited, and the prospects before mill men at the moment of writing are not very encouraging. It is greatly to be feared that the British paper trade is going through rather a severe strain, similar to what was experienced at the close of 1913, and judging by the statements that have been made at the annual meetings of paper companies recently a warning has been given that no large profits need be anticipated unless the present dull and inactive state of business becomes completely revolutionized at once. Most of the mills show declining profits, and as all efforts have failed to secure an increase in the price of papers of every description, mill men have had to give serious attention to labour saving machinery and to working out a decrease in the cost of production. Unemployment is still somewhat high at the mills and machinery in very few cases is running at full capacity. From the continent the news reaches London that the paper industry there is still in a gloomy condition, and business transactions are unsatisfactory.

There is an improvement in the sulphite and sulphate market and a few contracts have been settled at prices satisfactory to producers, notwithstanding the fact that paper mill owners have been holding back for some considerable time. Sulphite easy bleaching and sulphite strong are now firm. Good grades of soda pulps are inclined to be hardened as regards prices and the outlook is more cheerful. Scandinavians report that enquiries from American sources are still plentiful, and business is done at full prices. The European markets, however, are affording them very little profit. The Germans are stated to be creating a greater interest in the American market, owing, no doubt, to the recent dealings with Scandinavia and the dull state of the European paper industry. Quotations are about as follows:

Sulphite bleached No. 1	\$56.40	to	\$62.40
Sulphite easy Bleaching No. 1	37.20	to	39.60
Sulphite strong	38.40	to	39.40
Soda unbleached No. 1	34.80	to	36.40
Soda Kraft	38.00	to	38.60

All prices are c.i.f. London, and other English ports.

The mechanical pulp market continues quiet and dull. There are rumours of a few contracts having been settled at current rates, but beyond these new business is scarce and supplies are delivered on standing contracts. These supplies have recently been somewhat heavy, so it may be taken for granted that stocks at mills, considering the depressed state of the paper trade, are large. Scandinavians also report that their mechanical business is also lifeless, so much so that Norway has gone down as low as kroner 31 and kroner 32 to fix up a sale. These prices also included the agent's commission and they show that even the Norwegians are in sore straits for business. Prices are about as follows in England:—

Pine 50 per cent moist (unwrapped)	\$10.08 to \$10.75
Pine dry	20.40 to 30.20

All prices are c.i.f. London and other English ports.

Rags of all descriptions and grades are experiencing a limited demand, but prices are unaffected. Stocks in most of the centres are plentiful and during the past months some good shipments have been made to Canada. The Esparto trade is still somewhat against the views of paper mill men, and prices are in sellers' favor. Only limited supplies are available for Spring and early summer shipment, and the market for new crop has not opened yet. Complaints are being heard of the continued high levels that Esparto has reached, and from all accounts there is no likelihood of an expected easement in the price for some time to come. Messrs. Ide & Christie report that: "Even viewing conditions, there would appear to be a sufficiently serious outlook over the next few months to justify sellers in stiffening their backs as to further engagements."

The chemical trade is going through a period of quietness. So far prices are unchanged. Bleaching powder is quoted \$28.20, caustic soda \$48 for 76-77 per cent per ton, soda crystals \$13.80, sulphur \$28.20 per ton, salt caske \$10 per ton, ammonia alkali about \$14 to \$17.50 per ton, according to package. Rosin and sizing are very dull, and prices are very easy. China clay is in great demand, so much so that the accommodation at Fowey, in Cornwall, is not sufficient to cope with the shipping. Naturally, the recent pronouncement that clay is to be used in soap manufacture has caused the liveliest satisfaction amongst the clay men. Gypsum, pearl hardening and other fillings are dull, and prices unchanged.

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Pulp and Paper Magazine

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VOL. XII.

MONTREAL, MAY 1, 1914

No. 9

The St. Maurice Storage Scheme Delayed

It has just been announced that the work on the proposed storage dam on the St. Maurice River has been held up owing to the failure of the companies who will receive benefit from the same to accede to the wishes of the Government in paying a small amount annually as a tax to be held as a sinking fund to overcome the expenses made in connection with the dam. In imposing such a tax on those companies interested, the Government has sufficient precedent to warrant their action. In Ontario, it has been the custom of the Government in carrying out this conservation and storage work to impose a small tax on those industries receiving the benefit, that is, those concerns using the power from the river on which the conservation work has been carried on.

The storage dam on the St. Maurice River will undoubtedly be a great benefit to the pulp and paper concerns and lumbering interests along that and tributary rivers, and in carrying out such a scheme of conservation the Government has had the interests of these concerns in mind. It, therefore, seems reasonable that their objection to the Government's action is rather unwarranted. The country has much need of such conservation work being carried on, and unless those industries effected give their co-operation and assistance, there will undoubtedly be considerable delay in carrying the schemes into effect. It is hoped that the objections raised will be overcome, and that the work on the St. Maurice River will go ahead without delay.

Increased Freight Rates on Lumber

The decision of the Canadian Railways to cancel the summer schedules of tariff on lumber, early in May and maintain the winter schedule all the year round on lumber from Ottawa Valley points to Montreal, is one of very great interest to all branches of the industry in that district. The advance will be a serious thing for the export and domestic trades of Montreal, as well as a disadvantageous factor to the Ottawa lumbermen. The increase proposed, amounts in some instances to one cent per hundred pounds or between thirty and thirty-five cents per thousand feet, and it is thought quite likely that winter rates on paper and pulp will also be maintained.

The reason for this increase is said to be due to the fact that the Ottawa River route to Montreal is practically disregarded at the present time, and for that reason there is no water competition to the railways in that district. This river route was once extensively used by lumbermen and paper manufacturers, but it appears to have lost its prestige as a waterway of commerce. It appears, however, as if the only remedy would be a revival of this means of shipping, so as to provide water competition once more. It is held that if the railways carry out their intentions, it will require the construction of the Georgian Bay Canal to bring the rates down again. It will be to the interest of paper and pulp manufacturers to give this matter their very careful consideration.

A Tariff Change Unlikely

We have heard some talk of late regarding the likelihood of a reduction of the duty on paper going into the United States, in which connection the belief is expressed that the Democratic Administration will not survive the test of the next election. Such action would undoubtedly be a serious matter for many Canadian paper mills. We, however, cannot coincide with these views. In the event of the Republican Party going into power at the next election, it is a question whether they would restore paper duties. The consumption of paper in the United States is far in excess of the domestic production, and the importation of paper from Canada is increasing to a marked extent. Moreover, Canadian mill owners content themselves with knowing that they have means at hand with which to combat such a possibility, which view is upheld by the happenings of recent months. It is, therefore, unlikely that the apprehension of such action has had any serious influence in postponing further developments of the paper industry in Canada. There are many other factors exerting an influence on commercial conditions in this country at the present time, which are undoubtedly the reason for the temporary postponement of any pulp and paper proposition that may be on the tapis.

of Custom Appeals, on May 12, 1913, reversed the Board and held that the favored nation clause of treaties entitled the countries having such treaties with the United States to free entry of their wood-pulp and paper on the same terms as had been given to Canada and that the Court was given jurisdiction to enforce that right.

The nations which had originally made inquiries concerning the policy of the Government in enforcing the Act of July 26, 1911, renewed, immediately after the decision of the Court of Customs Appeals, their representations, and urged upon the Department acquiescence in the decision as made.

The Government decided on July 28, 1913, to acquiesce in the decision, and since that time the bulk of importations of that character have been liquidated free, and since September 19, 1913, all such importations have been so passed. Also where importations had been before July 28, 1913, liquidated for duty, and the protests on that date were still in the offices of the collectors, the collectors sustained the protests under the instructions of that date, and made refunds accordingly. That is, refunds have already been made upon those protests which were included in the appeals which the Court of Customs Appeals decided, as well as upon protests which were still in collectors' offices on July 28, 1913.

Protest Sustained in Wood Pulp Case

The decision of the Board of General Appraisers in the United States in the duty refund protest case is one of far-reaching effect, and many of the American manufacturers will benefit considerably thereby. There are upwards of 5,000 protests involving refunds, estimated at \$3,000,000 of duties collected on Canadian and foreign pulp-wood imported into the United States up until September 19th, 1913.

Under Section 2 of the Reciprocal Act of July 19th, 1911, between Canada and the United States, pulp-wood and paper not exceeding 4 cents per pound entered the latter country free of duty. When this act was passed various European nations made inquiry of the Executive Departments of the United States to ascertain what action was going to be taken of the rights of such countries under the favored nation clauses of their treaties with this country. They claimed to be entitled to the same treatment as had been accorded to Canada by statute.

The Supreme decided, on January 9, 1912, that the decision of the court in the matter raised by such inquiries could have included a grant of free entry by executive action without a bill. The matter was on to be tried before the Board of General Appraisers, whose decision was in favor of the Americans. On appeal, the Court

DULL EDGES IN SUPER-CALENDERED PAPER

This unwelcome appearance may be due to several causes. The chief is too fast running of the calender. The best circumferential speed of the rollers with the heavy machines now used is 12 metres per minute, which should not materially be exceeded. Hence the larger the rollers, the slower they must run. Excessive speed of the calender conduces to waste in other ways beside that of the dull edges which have to be cut off, and the faster the calender runs, the deeper the dull edge will be. The paper is much more likely to be torn or damaged in other ways. Besides, a comparatively low rate of speed gives a better lustre, for then every part of the paper is subjected to the friction of the pressure for a longer time. Lastly, the construction of a supercalender is by no means such as makes it fit to be driven except at very moderate speeds, and attempts to increase the output by speeding up will surely result in rapid wear or injury to the machine, in addition to all the other troubles above mentioned.—Zentralblatt.

The Canada Western Lumber Company's profits for 1913 amounted to \$284,988. After deducting interest on debenture stock, \$429,170; interest on loans, etc., \$179,037; debenture stock sinking fund provision, \$187,903; and reserve for depreciation \$173,293, etc., the amount carried forward is \$13,288. To this balance has been added the undivided profits of Dec. 31, 1912, making the total accumulated profits carried forward \$629,713.

MANUFACTURE OF SULPHITE WOOD PULP

By G. B. STEFFANSON.

This series of Articles has been prepared at the request of the Editor by Mr. Steffanson to give a comprehensive discussion of the various sulphite processes, chiefly for the benefit of the younger men in the industry.—Editor.

Article I.

Already in 1866 the American chemist B. C. Tilghman patented a process for the manufacture of sulphite wood pulps, and the credit of the invention is undoubtedly due to him.

The reason why he did not succeed in operating his process on a large scale was that although he spent many years of time, and the largest part of his fortune on practical experiments, he thought that the soda pulp industry was too strong a rival of his process, and finally he abandoned it in favor of other inventions of his, which promised larger and quicker returns. The want of a thorough technical knowledge was probably another cause why Tilghman and his assistants did not follow up his inventions.

The credit of having worked on a practical scale an invention for the manufacture of Sulphite wood pulp, made independently of Tilghman or others, is due to the Swedish chemist, C. D. Ekman. During 1873 and 1874 he built the first Sulphite pulp mill in Sweden at Bergvik. This mill was completed in Oct., 1874, and early in 1875 he was able to manufacture sulphite pulp which could be successfully used for paper making and found a ready demand.

Because Ekman kept his inventions a secret until 1881, when he patented it in England and moved over there to build a sulphite pulp mill, the priority for having worked the sulphite pulp process on a practical scale has been claimed by the German Dr. A. Mitscherlich.

Dr. Mitscherlich and his brother started laboratory experiments for the making of sulphite pulp evidently influenced by Tilghman's invention.

In 1874 he patented a method for the manufacture of sulphite pulp, and the following year he was able to start a sulphite pulp mill, but he could not produce an acceptable pulp until 1876. His patent was later annulled when it was proved that Tieghman had been granted a similar patent previously.

Dr. Mitscherlich can therefore not be considered as the founder of the sulphite pulp industry, as was formerly thought to be the case, but much of the credit of the early development of the industry is undoubtedly due to his energy and perseverance and that of his assistants.

Later inventions such as the German Dr. Kellner, the Swede Flodquist, and others, have only improved different details of the process.

The first sulphite mill in the United States was built in Alpena, Mich., in 1887 under the Dr. Mitscherlich patent. Already in 1885 the first Canadian sulphite pulp mills were built in Cornwall and Merriton, Ont., on the Ritter-Kellner System.

The Woods Used.

On this continent the kinds of woods used in sulphite pulp manufacture are principally White Spruce (*Picea Alba*), Black Spruce (*Picea nigra*), Balsam fir (*Abies balsamea*), Hemlock, (*Tsuga Canadensis*), to some extent Tamarack or Larch (*Larix Americana*) which is however nearly extinct, and in the Western States the Cotton wood (*Populus Minilifers*).

Aspen (*Populus tremulaides*) and Poplar (*Populus alba*) have to some extent been used in sulphite pulp manufacture in Europe, but the match factories are now buying this wood at prices which are much higher than the price of other kinds of pulp wood. On this continent these woods are only used in isolated cases for the manufacture of sulphite pulps.

In order to obtain a uniform pulp, it is of great importance that different kinds of wood are not cooked in admixture, as the different incrustations require varying lengths of time for their decomposition. Even the same kind of wood cut on different grounds can produce irregularities in the pulp if cooked together.

White Spruce yields a white pulp free from rosin, but not so very strong.

Black Spruce is more resinous and some care is required in the manufacture from white spruce, but is stronger than the pulp produced from any other kind of wood on this continent.

Balsam Fir contains a large percentage of rosin and care must be taken to remove it in the manufacture. The pulp is of good color but not strong.

Hemlock gives a somewhat coarse dark pulp which is free from rosin and is quite suitable for newsprint and similar papers where a high color is not essential.

Tamarack is resinous but gives a fairly high colored pulp. The fibre is shorter than Spruce fibre.

The Scandinavian Spruce (*Pinus sylvestris*) yields undoubtedly the strongest fibres of all kinds of wood used in the manufacture of sulphite pulp, but if properly cooked, both white and black spruce should yield a pulp that in strength could compete with the majority of Scandinavian and German brands of Sulphite pulp sold on this continent.

For the production of bleached pulp the wood in this country should be more suitable, because it does not as a rule contain black knots which cause endless trouble in some parts of northern Europe.

The Treatment and Transportation of Wood.

The wood should preferably be cut between the middle of November and the middle of March, as wood cut during this period gives the strongest fibre and does not rot very easily.

If the wood is to be dried, before it is taken out of the bush, and the place where it is piled or left to dry is not open and windy, the bark should be stripped off the log in strips a few inches apart to admit the air to the wood in order to prevent rotting and the growth of fungi.

The wood which is to be peeled should be cut as early as possible while the sap runs as the fibre loses in strength while the sap is running. The bark should be peeled off, and the branches removed only as far as the tree is meant to be cut up for pulp wood, the top being left intact, the tree is now left in this condition for about six weeks before it is finally cut up. While the tree lies thus, the bark, branches and the needles in the top attract the sap, which causes the

small dimensions, but later no cracks are formed in drying while the log is lifted, specially in driving in the mill.

Many of the bidders should be carefully re-examined, these firms set up a lot of room in racking the logs and this inaccuracy in measuring and great trouble where the wood has to be rossed. This applies particularly to wood of small dimensions.

The transport of the wood in the forest, in the river, or by rail need not be discussed here, as it is the business of the wood ranger.

The arrangements for the transportation of the wood from the boom or railroad car to the wood room or the pile can be arranged in many different ways. The problem before the engineer is to construct the most economical transportation arrangements, with due regard to location, wages, cost of materials, the demand for uniformly dried wood, etc. The old method of conveying the long logs from the boom or car, by means of an elevated conveyor, to large storage grounds where it is piled in such a manner as to allow the air free access, has many advantages, particularly if high grade pulp is manufactured. The wood is in this case usually taken to the wood room on railway cars.

This system is still very extensively used in European mills, but it can only under certain conditions be considered suitable here in Canada, on account of the higher wages.

It is more economical to take the wood to the slashers first by means of chain conveyors and further to the pile or mill on chain conveyors or water spouts. These conveyors should be so arranged that one high conveyor takes the wood to the piles, and the returning chain, under the pile, takes it to the mill, or so that one conveyor takes the wood to the high conveyor at the pile as well as to the conveyor connecting the pile with the mill.

A suitable of conveyor in the wood room is a wide water spout running along side the barkers and provided with a circulating pump. In cold weather the water in this spout should be warmed so that the wood is thawed out before reaching the barkers.

Preparation of the Wood.

There are three types of cross-cut saws, the balance saw, stationary circular saw, and the band saw.

The balance saw is cheap but has a small capacity, and is out of the question except in small mills.

Stationary circular saws, so arranged that the logs, by means of chains, are carried over a table provided with a number of saws, are cheap in first cost and maintenance, all types of circular saws, however, cause a considerable loss of wood particularly if the log is of large diameter, when the thickness of the saw causes increasing.

The band saws are also provided with chains which take the logs to and past the saws. Both the ascending and the descending portion of the saw blade are cutting and the length of the cut logs is equal to the diameter of the saw pulleys. This type of saw is the most economical one, but for large mills it is never the first considered because it causes less loss through not that they are slower.

On the subject of bark barking, there are three methods of barking namely different types of machines, namely drum barkers, disc barkers, and automatic barkers for long

barkers and requires about 50 per cent more power. It saves all the wood wasted by other machines, which amounts to from 6 to 16 per cent or even more. The drum barker is however suitable only in sulphite mills where clean pulp is not very essential, or where bleached pulp is manufactured and the look of the unbleached pulp is of no consequence. The drum barkers do not remove all the last thin layer of the bark, and it would be too costly to remove it by hand. This thin layer of bark retains a dark color after cooking, and shows up as dark fibres or dirt in the pulp which is however quite as easily bleached as any other part of the pulp. It is to be noted that the water in the drums has to be heated, and this causes extra expense, unless some exhaust steam, which otherwise would be wasted, can be used for the purpose. The attendants required for drum barkers in a large or medium sized mill are less than for other barkers, but as any bark remaining in cracks or round knots must be removed by hand, or for some drum barkers part of the wood sent through twice, the saving in wages is not very large.

Automatic barkers are most suitable for wood of small dimensions, but much attention is necessary, and reliable men should work the machines to keep down the loss of wood. It may be remarked here that these machines are usually built for the barking of logs before they are cut up into lengths fit to handle.

The most common barking machines are the disc barkers of which there are several types. The usual type with four radial knives wastes a considerable proportion of good wood, because the operator turns the log by hand, and when he changes the position of his hands the knives cut over a portion of the log which

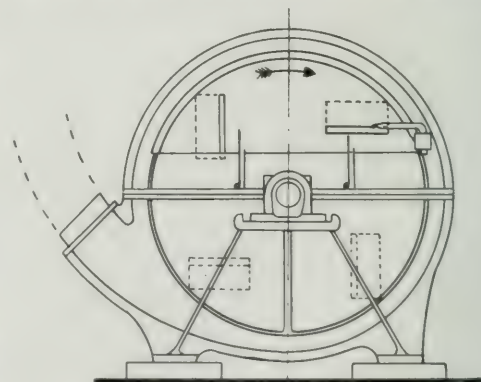


FIG. 1.

has already been barked. Wood which has been barked on such a machine is easily recognized by the angular surface which it presents.

In order to prevent this waste, barking attachments have been designed. They bark the wood more uniformly, but in order to give the machine capacity, the knives must be set to project 1 1/2 in. or more, which also causes great loss of wood.

Undoubtedly the most economical disc barker is the machine which was introduced in most of the Scandinavian mills about 15 years ago. In this machine the knives are parallel with the diameter of the disc and not radial (see figure 1). The wood is supported on adjustable blunt edged supports placed at

the ends of the log, and the log is turned by a screw mechanism. This method is more economical of all bark barking machines, and causes less waste than other

right angles to the disc, and to prevent a longitudinal motion of the log, one end of it rests against a swivel point or a ball. The knives touch the log tangentially and cause it to rotate. All the operator has to do is to keep the log against the disc and prevent it from rotating too fast. These machines have a greater capacity than any other type of disc barking machines, as no time is wasted in turning the logs or manipulation of barking attachments. The knives need not and should not project more than 1.32 in., in order to save wood.

In barking wood with all the bark on, the losses in using the different machines are approximately as follows:

Drum barkers 10 per cent.

Automatic barkers 15 to 35 per cent.

Disc barkers with attachment and radial knives 20 to 30 per cent.

Disc barkers with knives parallel to the diameter of the disc 15 to 20 per cent.

The bark is about 9 per cent of the total wood, the remainder being loss of useful wood. In barking wood which has lost the greatest part of the bark in driving, the loss of wood is higher.

In a well arranged wood room, the logs should be conveyed as close to the barker as possible, so that the operator can easily reach them, and there should always be an ample supply of wood at hand. Cross conveyors operated by the barker man are apt to cause considerable waste of time.

The conveyors from the barkers to the chippers should be arranged so that the logs need not be lifted from the barkers but can be allowed to slide on to the conveyor. If possible these conveyors should be arranged on the floor below the barkers and they should be of the chain or belt type, and feed the wood into the chipper spout, so that the chipper man can give most of his attention to the chipper, which is of very great importance.

The barking machines should be provided with fans, cast in one piece with the disc for blowing the bark into the boiler house, or to a waste-conveyor. The machines should be able to blow the bark to cyclone separators in the boiler house, unless the distance is greater than about 600 feet, provided there are no sharp turns in the pipes. In case of greater distance, a covered conveyor into which the bark is blown must be used. All the bends in the pipes should be of as big radius as possible, and the bark should be blown into the conveyor, in a direction coinciding, as nearly as possible, with the direction of motion of the conveyor.

The barkers should be driven individually, either by motors or from counter shafts. In the latter case the countershaft should have a tight and a loose pulley against the main shaft, so that any one machine may be stopped without stopping them all, and without having the barker belt running during knife-changing. In a large mill this arrangement saves time, and one man can be made responsible for the correct setting for all the knives. When the barkers work on individual piece work, this arrangement is particularly satisfactory, especially when all the barkers take their wood from the same conveyor. The knife grinder then changes the knives in all the barkers in turn at fixed intervals, and the men moved from one machine to another are thus all supplied with wood at the same rate.

The disc chipper is now used almost exclusively; in a few old mills in Germany circular saws are still

employed, but the guillotine chipper is no longer used. There are a few different types of disc chippers. The number of knives is usually two or three, arranged radially. The spout may be parallel to the shaft and inclined against the disc, or inclined against both the shafts and the disc. The discs are made either of c. i. or cast steel. Of these the more expensive machines with cast steel discs, two radial knives, and a spout inclined against the disc and the shaft, are preferable. Cast steel discs do not crack as easily as c. i. discs do thereby risk of life and stoppage is diminished. The inclined spout makes for economy of power, as the plan of the cut is at a more acute angle to the fibre in the wood.

Two knives have been found to be quite sufficient in most cases. The knives should be set to work as nearly parallel to the plane of the cut as possible. By this means the chips are broken up better, which is of special importance where no disintegrators are employed. Frequently, chippers with a fan combined are employed, and in such cases the chips are blown to the disintegrators or chip screens. The cost of maintenance of such chipper arrangements is low, but they require more power than other chippers.

It is bad policy to judge a chipper by its capacity alone, because if the chipper is heavy enough there is practically no limit to its output, but the quality of the chips suffers accordingly. The speed of a chipper should never be greater than to allow the logs to fall against the disc between the cuts, in the case of higher speed the losses through "sawdust" are considerable, and the chips become uneven.

Unless the chipperman's time is occupied with carrying wood, he has plenty of time to see that the logs enter the spout properly, and to keep them from jumping in the spout, which causes uneven chips and the production of a great quantity of long slivers and sawdust. In cold weather the logs should be properly thawed before going into the chipper, in order to obtain uniform chips. For this purpose a thawing tank should be arranged, preferably in connection with the above mentioned water spout conveyor.

The working of the chipper can be judged, apart from the appearance of the chips, from the amount of sawdust obtained from the fine chip screens. This should not exceed 3 per cent.

Another important factor in obtaining uniform chips is the condition of the bed knives in the spouts, which should never be blunt. This point is very often neglected, particularly in old mills where the chippers are of such a design that the changing of these knives is a lengthy and expensive proceeding. This is however easily remedied by fitting the machine with a modern spout, as supplied with up-to-date chippers, where the bed knives can be taken out and regulated from the back side of the spout.

The chipper should stand on a perfectly rigid foundation, but the bed plate of the machine should rest on a layer of hard tough wood, or specially prepared liner felt. This is necessary in order to diminish the vibration, and modifies the risk of bursting of the disc, and generally prolongs the life of the machine.

Where c. i. discs are employed, it is advisable to carefully shrink stout steel rings on the circumference of the disc, in order to prevent it from bursting completely in case it should crack, which happens frequently on account of the uneven heating they are subject to.

There are four distinct types of disintegrators: the coffee mill type, Can's disintegrator, the Lombard type and the tooth crusher type.

The first type is very similar to the old coffee mill. It runs with gear and is the only adjustable disintegrator, but its capacity is comparatively small, and it requires more space and is more costly to install than the other types.

Can's disintegrator consists of two or more discs on a horizontal shaft running inside a housing. The discs are provided with two or more rows of pins fastened to their sides, and these pins run between rows of pins fastened to the housing. The other end of the pins should be joined by steel rings, to prevent them from bending unless the whole machine is made of cast steel. This disintegrator is most commonly used; it requires more power than other types, but it is cheaper at first cost and up-keep. The machine should be placed on a firm but tough foundation.

Lombard's disintegrator is similar in construction to Can's but the chips are broken up by means of movable arms. This machine requires somewhat less power than Can's but is less effective. The first cost of a Lombard machine is considerable and it is expensive in up-keep.

The tooth-crusher is of a later design. This disintegrator seems to find a growing market on this continent.

All the disintegrators reduce more or less of the chips to saw-dust, but where the chips are to be screened on coarse screens they can not be dispensed with, unless the chippers break up the chips thoroughly. Where it can be arranged the disintegrator should deliver direct into the chip screen, in order to avoid using a conveyor.

There are two types of chip screens, flat shaking screens and rotary screens. Where the screens can be arranged on a solid foundation, the cheaper flat screens are to be preferred. If the screens have to be arranged on a top floor, or on wood structures rotary screens are the better type.

The flat screen should be inclined about 10° and they are usually made double, the top one being coarse, and the lower one a fine screen. Conveyors are arranged to remove sticks and knots, sawdust and chips, to the rechipper, boiler house, and chip bins respectively.

The cheapest screen plates as regards up-keep are perforated sheet steel plates, but they have a much smaller capacity than wire screens. For longer chips $11\frac{1}{2}$ in. and longer a wire screen with rectangular meshes is preferable for coarse screening. A suitable wire for this purpose is made with $\frac{1}{4}$ or $\frac{3}{16}$ in. wire for warp, and $3\frac{1}{2}$ in. for weft. The weft is wound round the warp for a distance equal to the width of the meshes. The warp wires are 6 to 7 ins. apart, and the distance between the wefts varies with the chips from $\frac{1}{2}$ to 1 in. The holes in the perforated plate could be of a diameter $3\frac{1}{8}$ to $\frac{1}{2}$ in. larger than the length of the chips. The fine screens should have perforations not larger than $3\frac{1}{8}$ to $7\frac{1}{16}$ in. in diameter. Ordinary steel wire, with $\frac{1}{4}$ in. mesh, is suitable for fine screens and inexpensive, although it has to be changed frequently.

A good way of utilising the screenings is to arrange two fine screens, one with not over $\frac{1}{4}$ in. mesh, and the another with $\frac{1}{2}$ in. mesh. The fine sawdust is saved, and the coarse sawdust mostly consisting of chips which too much in the disintegrator is collected in a waste bin and cooked separately. These two types of screens are so that the out put of the wood-chipper is distributed, but they can be cooked separately and give a very clean pulp.

The rotary chip screens can be arranged consecutively in one length supported on rollers. It is however cheaper in upkeep to arrange them separately in steps, and with through going shafts, although they occupy a larger space when arranged in this manner.

There are many types of re-chippers, of which a miniature wood chipper is the best from many points of view. They all produce an inferior quality of chips, however, and the sticks and knots would probably be burnt to better advantage, especially in Canada where wood is generally cheap and coal is expensive.

The chips should be taken to the bins by means of bucket conveyors instead of fans. The latter produce large quantities of dust or wood-flour, which in cooking consumes acid without yielding any pulp, and sometimes this dust appears in the pulp, uncooked, in the form of specks.

The lengths of the chips depends on the method of cooking employed. For Mitscherlich unbleachable pulp, the chips should be $1\frac{1}{4}$ to $1\frac{3}{4}$ ins., for ordinary news print or "quickly cooked" pulp, $\frac{3}{4}$ to 1 in., and for unbleachable pulp $\frac{5}{8}$ to $\frac{3}{4}$ in. long.

In many mills the cost of the preparation of the wood is kept down to such an extent that the quality of the chips suffers considerably, quite regardless of the fact that much more can be gained by less waste in the wood room, not to speak of the better price obtained for cleaner pulp. The greatest part of the dirt in the pulp is undoubtedly due to the faulty treatment of the wood, not only in the barking, but still more in the chipping and screening.

In preparing the wood the production of uniform chips, both as regards size, and their being free from dust, large sticks and knots, is of the greatest importance. The pulp produced from uniform clean chips is strong, uniform and clean. Slivers and dirt once in the pulp are very difficult to remove completely.

The yield from uniform chips is much greater.

Where different kinds of wood are used, it is of great importance to cook them separately. The incrustations in the different kinds of woods are not very different, as far as the modern research work has shown, but they are present in different quantities, and react with varying rapidity with the acid. In several European mills, wood from trees of the same kind grown on a rocky, and on a fertile soil are cooked separately, in order to avoid an uneven pulp, but this is of little or no importance when the wood is not properly seasoned, and thus shows varying absorption of acid.

The amount of wood used per ton of pulp produced varies considerably, and this factor of the manufacture is often capable of being considerably improved. Many mills used as much as 2, or even $2\frac{1}{4}$ cords of wood per ton of pulp.

With medium quality of rough seasoned wood, the quantity required for strong Mitscherlich pulp, should not exceed 1.65 to 1.70 cords, for ordinary "quickly cooked" pulp 1.80 cords, and for bleachable pulp 1.9 cords per ton of 2,000 lbs. It is to be noticed, however, that the better utilization of the wood means, as a rule, a slightly increased cost of labor. In many cases the increased yield of pulp is worth many times the increased cost of manufacture, but often the installation of the most suitable machines, and the proper supervision of the wood room, wipes out any difference in the cost of preparing the wood, and sometimes even lowers this cost.

It is hardly possible without going into many details to give figures of the capacity of the different

wood preparing machines. An idea of how far the different types of machines may be forced economically, is given here on the assumption that the wood comes to the mill in lengths of 20 feet, or in shorter lengths divisible into lengths of $2\frac{1}{2}$ ft. and that the wood is cut up into length of $2\frac{1}{2}$ ft. and is of medium size and quality, with regard to straightness knots, etc.

A balance saw can cut 6 cords per hour while stationary circular saws and band saws will handle as much as 50 cords an hour.

The drum barker cleans about one cord per hour. The capacity of automatic barkers depends entirely on the speed with which they are fed, and the barking arrangement, but generally speaking they have no greater capacity than an ordinary disc barker.

A disk barker with radial knives, and fitted with a barking attachment, should have a capacity of from 1.2 to 1.4 cords per hour, and a disc barker with the knives parallel to the diameter, should have a capacity of 1.5 to 1.7 cords per hour.

A chipper with two knives, making long chips, should run 175 to 200 R. P. M., and 225 R. P. M. for shorter chips.

If the chips should be uneven in spite of the machine being properly fed, the speed must be decreased until the desired result is obtained.

There are chippers on the market guaranteed to cut 15 cords per hour, but it is not advisable to calculate for more than 10 cords per hour, even with the largest machines, if uniform chips are desired.

The capacity of the disintegrators depends on the length of the chips and the size of the machine. It is advisable to have one disintegrator for each chipper. Coffee mill type disintegrators of a sufficient capacity for large chippers are however hardly to be found.

When different lengths of chips, or different kinds of wood are chipped, the speed of the disintegrator should be variable, except in the case of the coffee mill disintegrator which can be otherwise adjusted.

The capacity of chip screens is usually taken to be 1-10 of a cord per square ft. per hour, but this capacity can be very much exceeded, although the quality of the chips suffers accordingly.

Rotary screens have a somewhat larger output per square ft. than shaking screens.

The best arrangement is to have one chip screen for each chipper.

Preparation of the Acid.

The acid used in the aqueous solution of calcium or magnesium bisulphite, containing a large portion of free sulphur dioxide, $\text{Ca Mg (HSO}_3)_2 + 2\text{--H}_2\text{SO}_4 + \text{NH}_4\text{O}$

It is prepared from sulphur, S , or iron pyrites (FeS_2), and limestone or dolomite (CaCO_3 or MgCO_3) or burnt lime or magnesia (CaO or MgO).

The acid making comprises four different operations viz: the burning of the sulphur or pyrites for obtaining the sulphur dioxide (SO_2), the charging of the limestone or the slaking of the quick lime, the acid making proper by combining the two products and water, and the recovery of the SO_2 which last operation is intimately connected with the cooking.

The acid making plant consists of the following parts: sulphur or pyrite burners, gas washers and coolers, the acid making apparatus, coolers for recovered gas, and storage tanks.

There are two main types of sulphur burners, the old retort, and the newer rotary burner. The retorts can be used with advantage when pure sulphur (99 per cent or more) is burned, especially if Silician sulphur is used and the retorts are fitted with melting pots for sulphur on top, from the which the sulphur runs down. This is done in order to prevent an excess of air in the retort, and in order to dry the sulphur which later will be more fully discussed later.

It is very important that the admission of air into the burner can be regulated accurately, and that hot secondary air can be admitted, in such a manner that it is thoroughly mixed with the gas from the burner, in the combustion chamber, at the back of the burner.

The rotary sulphur burners can be used with advantage for burning impure sulphur, or sulphur liable to form an oily skin on the top of the melted mass. The impure sulphur should however be avoided, unless it can be obtained at a very low price per unit of pure sulphur. When burning low grade material, the burners have to be frequently cleaned, and this causes interruptions and increased cost of working them. Freight and handling has also to be paid for material which is of no use in acid making, where low grade sulphur is used.

The rotary burners can not conveniently be fitted with melting pot, but there are other kinds of automatic feeds. Attention should be paid to the proper regulation and admission of air, and hot secondary air, as mentioned above.

The old type of pyrite burners with moveable grates, has now gone out of existence almost completely, partly on account of the high cost of working these burners, and partly because of the waste of materials in crushing the pyrites to suitable size; the main difficulty with this burner is that the cinders still contain about 4 per cent or more of sulphur, which makes them unfit for iron manufacture.

The most commonly used pyrite burner is the Herreshoff burner, which is a cylindrical vertical shelf burner, made of acid proof and fire proof brick with a sheet iron shell. There are usually five shelves in the burner, and arms, and carried by a vertical air cooled shaft, rake the materials from one shelf to the next one.

A dryer made of sheet iron of the same construction as the shelves in the burner, and forming the top of the burner, should be fitted in order to prevent the pyrites entering the burner in a moist state. Otherwise wasted hot air from the burner is used for this purpose.

The pyrites should be fed automatically to the dryer and from there into another adjustable automatic feed arrangement on the burner.

When starting up the burner has to be heated up by means of coal or wood, and the pyrites are fed into the burner. The burners should be fed at such a rate that the heat obtained by the burning pyrites is sufficient to remove the sulphur, but not in larger quantities than to permit the cinders leaving the furnace, so cooled by the entering air that they do not show signs of glowing. The sulphur in pyrites which contain no other metals than iron, can be nearly completely burnt off, only one per cent or less remaining. Any sulphur combined with copper or tin in the pyrites can not be burnt off.

Pure Pyrites (FeS_2) contain about 53 per cent sulphur but the commercial article only contains from 35 to 50 per cent.

In manipulations of the use of pyrites, great care is necessary to avoid mistakes, because pyrites cost so much more than sulphur in handling, and the burner plant is many times more than a sulphur burner plant. Some kinds of pyrites also contain minerals like Selenium, which causes serious trouble in the smoking, even when present in minute quantities.

If the pyrites can be delivered at the mill containing about 40 per cent of sulphur, or not less than 40 per cent of available sulphur, at a price per unit of sulphur in the pyrites amounting to about 60 per cent of the price of pure sulphur, it is generally good economy to use pyrites.

The washing and cooling of the gas is of particular importance when pyrites are used. The best arrangement is to conduct the gas through large vertical leadlined pipes or towers which are provided with water sprinklers, which partly serve to remove the fine iron ore dust from the gas and also to keep the lead lining cool, as well as to some extent to cool the gas.

The wash water should be discharged at a temperature not less than 175° F., because at lower temperatures the water will retain SO_2 , which will then be lost. It is best to arrange one washing system for each two Herreshoff burners. The gas is usually drawn through the burners and forced through washer and cooler into the acid making apparatus, by means of a fan, these fans are best made of phosphor bronze, and fitted with water cooled bearings.

There are several types of gas coolers. Where a lead burner is employed, gas coolers can easily be made at the mill. The most suitable type of coolers are high rectangular horizontal lead pipes, stayed internally with lead pipes, and of such dimensions that the gas passes slowly through them. The stay pipes also serve the purpose of forcing the largest part of the gases to touch the sides of the water cooled pipes, and are in themselves good coolers if not placed horizontally, as the cooling water passes through them quickly. The whole arrangement is placed in a tank supplied with cooling water, the flow of which is arranged on the countercurrent principle.

There are several types of coolers on the market which give very satisfactory results, but they are all very expensive.

The ordinary type of cooler, consisting of a great number of 8 or 10 in. lead pipe, arranged successively or in series in a water tank, is unsatisfactory, on account of the fact that the gas passes through too quickly, or in the case of a sectional arrangement of the pipes, it passes through only a part of the section, and thus the cooling surface is not properly utilized.

The coolers should be easily accessible for cleaning and repairs.

When pyrites are burnt, the cooling surface should be about 15 square ft. per ton of daily production, and about this amount of sulphur burners are used.

In summing up the gas should be cooled to nearly the same temperature as the cooling water, before being admitted into the acid making apparatus. In other words the cooling should be so adjusted that the temperature of the acid does not fall below 55° F. This is particularly important in connection with some of the limestone acid making systems, in order to keep the concentration of the acid uniform all the year round. The water obtained from these coolers, and the residue from washers, can be used for diluting or washing the acid, or for use in the lime process.

As above mentioned there are two distinct systems of acid making, the limestone systems and the milk of lime systems.

Of the former system there are four modifications employing high towers, low towers, tanks or chambers.

The milk of lime system consists of tank or low towers, but the chamber systems were in early days also used as a milk of lime system.

The merits of the different systems can only be judged in connection with each individual mill. As a rule the milk of lime systems are the most costly in running expense, on account of the cost of burning the lime, but where the freight rates for lime and limestone are high, it must be considered whether the higher freight charges for the limestone, which is about 80 per cent heavier than the corresponding quantity of quick lime, would not pay for the burning of the lime at the quarry.

It was formerly thought that dolomite (Mg CO_3) gave a better and whiter pulp than limestone (Ca CO_3) whether burnt or unburnt, but this is not the case, as far as the limestone systems are concerned.

An equally strong and white pulp can be made by using limestone (Ca CO_3) as by using milk of lime, but it is not possible to obtain a high quality of pulp with the milk of lime system, unless the lime contains about 33 per cent of magnesia (MgO).

Generally speaking it is of little importance for the composition of the acid, whether limestone or dolomite, a combination of (Ca CO_3 and Mg CO_3) is employed.

(To be continued)

QUEBEC LUMBER EXPORT LAWS.

The Quebec Government, through the Department of Crown Lands, has taken steps to prevent the wholesale exportation of lumber to foreign countries by corporations which have been granted timber lands as subsidies by the Government.

Article 13 of the Woods and Forests regulations, passed by order-in-council in April, 1910, will apply for all Crown Lands given as subsidies to railway companies, to wit:

"The timber cut on such lands must be manufactured in Canada; that is to say, converted into pulp or paper, deals or boards, or into any article of trade or merchandise of which the said timber is only the raw material."

The article goes on to explain that timber, properly squared or made into ties, will be considered as manufactured, but that roughly trimmed lumber will not.

Sales of Crown Lands.

The Minister of Crown Lands will sell by auction on the 11th of August next timber limits in the regions of Ottawa lakes, St. John, Rimouski, Matane, Bonaventure, and Gaspé. Some limits offered have an area of over 2,000 square miles.

Timber limits along the Mistassibi, Ashpamouchouan, and Rat Rivers will be sold by auction, by the minister of Crown Lands on October 20th next.

A new condition is imposed on the limit holders, who will henceforward be obliged within three years to manufacture pulp paper in the proportion of five tons per day for every hundred miles of limits.

SOUTHERN PAPER COMPANY'S PLANT AT MOSS POINT, MISS.

"KRAFT" MADE FROM REFUSE OF NEAR-BY SAWMILLS. RECOVERY OF CHEMICALS MAKES PROCESS A COMMERCIAL POSSIBILITY.

The mill of the Southern Paper Company is the first development in American countries of the researches and inventions of Carl P. Carlson, the eminent Swedish chemical engineer whose recovery system made the now famous Kraft papers a commercial possibility. Mr. Carlson was for many years known throughout European paper trades as the foremost fibre chemist in Sweden, and was the designer of upwards of twenty five successful mills in that country, Norway and Finland for the manufacture of sulphite fibre.

of commercial uses, incidentally recovering 85 per cent. of all chemicals for refuse in its own plant; and finally in reclaiming turpentine, alcohol and other by-products from the inerusting matter.

The Southern Paper Company was organized in 1912 largely through the efforts of Mr. J. L. Dantzer, secretary of the L. N. Dantzer Lumber Company. The plant was erected something more than a year ago, and it was last June that the first paper was made.

The refuse from the various saw mills of Moss Point



Photograph, courtesy of International Process Co. New York.
PLANT OF SOUTHERN PAPER CO.

The International Process Company, of New York and London was formed to exploit the Carlson patents in America. With Mr. Carlson as consulting chemist, Mr. A. W. Wern, formerly with Mr. Carlson in the design of the Carlson apparatus, and the operator of the Swedish mills as mechanical engineer, Mr. Joseph H. Wallace, of New York, as consulting engineer, and Mr. E. M. Sawtelle, formerly of the Westinghouse Electric and Manufacturing Company, as general manager. This company has developed apparatus for taking either saw mill waste as raw material and producing a superior grade of paper suitable for a great variety

and near by towns, principally slabs, that were for many years burned in tremendous quantities, are now cut in lengths of four feet, loaded on barges which are towed to the plant of this company and unloaded to a storage pile served by a conveyor on a trestle 900 feet long and 60 feet high.

From this pile the material is delivered by the conveyor as required to a wood preparing building, where the wood is reduced to chips. These are sorted and screened free from sawdust and bark, which are burned as fuel. The uniform chips are carried on a belt conveyor to the top of the digester building, the

lower portion of which forms an immense bin for storing chips prepared for the manufacture of fibre.

The digesters are located in the tallest portion of the building. They are of the tumbling barrel type of solid steel nine feet in diameter and twenty-eight feet long with conical ends arranged to revolve on trunnions which admit superheated steam while in motion.

The digesters are filled by gravity from the chip bin. The cooking liquor is then added, also by gravity and after the cover is bolted on steam is admitted, and the revolutions of the digester begins. The action of the liquor is chiefly solvent, the resinous matters being taken from the cellulose and drawn off and washed out in the diffusers, which occupy the building adjacent to the digester house. From the diffusers the pulp now thoroughly washed is dumped to a chest from which it is pumped through a screening and settling system, by which the fibres are soaked and cleaned free from knots, bark and other matter, and only the pure fibre goes to the paper plant.

Machine Room.

Two paper machines are installed, one a straight Fourdrinier, and the other a special machine for making so-called machine glazed lines, extensively used for envelopes for mailing catalogues, etc. The Fourdrinier will produce thirty tons per twenty-four hours while the other machine will make ten tons in a like time.

The papers are made of a natural dark brown color, and since no acids or colors are used are absolutely anti-tarnish, and on this account are very desirable for wrapping silver ware, cutlery, etc.

Recovery Plant.

One of the principal features of this plant and one that has a considerable bearing on making the process a commercial possibility is the department for the recovery of chemicals. Valuable chemicals are contained in the liquors and gases resulting from the process of cooking or digesting the wood. Volatile oils are given off and mixed with the steam used for heating the wood that is in contact with the solvent liquors in the digesters. This steam and gas is drawn from the digester at intervals during the cooking process, and the turpentine and other by-products are extracted by condensation for further separation and refining.

The solvent liquors are blown from the digesters with the wood after it has been completely cooked under the proper pressure of steam; and these liquors are separated and washed from wood pulp by the diffusion system which completes the washing process by the addition of a small amount of fresh water.

This feature of keeping the spent liquors to a high point of concentration is a most important element in the final recovery of chemicals and the diffusion system assists to a marked degree in excluding water that would otherwise have to be evaporated by costly methods from the spent, or so-called "black liquor." The black liquor as it leaves the diffuser is conducted to storage tanks, thence through pipes to the rotary furnace. On its way, however, a certain amount of liquid resin is extracted. The reduction of black liquor into a commercial article is accomplished by the process of separation that extracts enough water to enable the residue to burn.

The separation takes place in a special chamber and is accomplished by the heat generated in burning the

When the density is sufficient for the residue to support combustion, it is still in liquid form, and flows to a rotary furnace, where it becomes ignited and burns to a "black ash," which is laden with the chemicals that are recovered.

The black ash is not completely burned, however, in the rotary furnace. There is still some carbon left that must be consumed before the valuable salts are recovered, and this is finally accompanied by further reduction in a smelting pot. A blast furnace is used for this purpose and sufficient carbon remains to complete the reduction and fusion of the various salts that flow from the bottom of the blast furnace in a molten stream to dissolving tanks, where the salts are finally dissolved in water preparatory to going to the liquor preparing tanks.

This solution is causticized with quicklime in the preparation for fresh liquor for cooking pulp wood, and the process just described is repeated until the recovered chemicals again come back to be causticized.

The losses that occur in the use of chemicals which amount to about 15 per cent are made up by adding fresh material at the smelting pots and causticizing pans.

The first paper that was made by this company was in June of last year, but it was not until about August the first, of that year, that the plant began operating commercially, and the output at that time was but about twenty tons per day, while at this time the capacity has been doubled and something like forty tons are being manufactured each twenty-four hours.

Over two hundred men are employed in the plant and some are skilled operators. The mill starts Monday morning and runs continuously until Saturday evening, the operators being divided into three shifts.

The Southern Paper Company is controlled and largely owned by bankers, together with engineers and chemists under whose direction the developments have been made and who operate the plant.

Mr. J. Lewis Dantzler, of this city and New Orleans, is President, he is also president of the Standard Export Lumber Co., of New Orleans, as well as secretary of the L. N. Dantzler Lumber Company of this place. Mr. A. Shirley Benn, M.P., of London, England, and a director of the Hunter Benn Company of Mobile, Ala., is first vice-president. The second vice-president is Mr. Joseph H. Wallace, of Joseph H. Wallace & Company, industrial engineers. Mr. A. F. Dantzler, of Moss Point, vice-president of the L. N. Dantzler Lumber Co., is the treasurer. Mr. Joseph G. Mayo, formerly of the Spanish River Pulp and Paper Mills, Ltd., of Ontario, Canada, is the general manager.

Among the directors are also Francis H. Benn, of Price & Pierce, Ltd., London; William S. Hofstra, of Price Bros. Company, lumber and paper manufacturers, Quebec, Canada, and of the Diamond Match Company, of New York; and J. G. F. Lawson and W. M. Wallace, of Carrongrove Paper Company, of Denny, Scotland.

Others interested are Sir Alexander Klienworth, of Klienworth Sons & Company, London, England; A. E. Bowen of Wilson Sons & Company, E. Macky Edgar, of Spertling & Company, bankers, of London; J. Charles Potter, of the Wall Paper Manufacturers, Ltd., London; Hon. A. Bonar Law, M. P., I. Hamilton Benn, M. P., and other members of the English Parliament.

The plans for this million dollar paper plant were executed by Joseph H. Wallace & Company of New York, the renowned paper mill engineers of the world.

Size Difficulties

In order to ascertain the degree of sizing in a paper as stated in a recent issue of the *Wochenblatt fuer Papierfabrikation*—Dr. Klemm's swim test is often applied very successfully. For this test small pieces of paper (40*100 mm) are tried out as to the time they will swim on the surface of various solutions (2 to 10 minutes and longer if necessary). These tests will produce some very interesting figures with reference to how much sizing there is contained in a paper, further from what sources any size-destroying factors might be expected, and finally with some experience one might even find their origin and cause.

A paper is generally considered to contain enough sizing if same resists the chloride iron or the tannic acid test as many seconds as it weighs grams per square meter. These two tests, especially the iron chloride one, will give very minute results as to the amount of sizing contained in the paper.

For quick and superficial testing the old way with pen and ink or by drawing a small strip of a jacket soaked with ink across the paper, or by more or less wetting the surface of the paper will always be found practical.

Although the known ways and means for testing the sizing of a paper are sufficient in most cases, this cannot be said with reference to tests for determining the causes for any difficulties along these lines.

In such cases quite often reliable experts will arrive at wrong conclusions which seem theoretically correct but can easily be contradicted from a practical point of view.

A difficulty as to the sizing which was due to some mechanical influence. For instance a paper was found to be properly sized right after passing through the paper machine or even some time afterwards, but later proved to have rather poor sizing. This might be caused by not having the sheet "closed up" well enough on account of too "free" halfstuff, or through using wood which was grown too quickly or not sound and lean, in other words when the halfstuff was not properly beaten.

In order to overcome these disadvantages, and to maintain the sizing, a proper use of the presses will be found an important factor. Often faulty drying of the sheet, the heating of the dryers not being such as required under prevailing circumstances, will produce a size destroying reaction.

Quite often carelessness is shown in the manner in which the alum or like substances are added. What disadvantages are shown in case the alum is added undissolved, and further, is there any chance for size trouble on account of this form of adding the alum? Is it not possible that only part of the alum will have any timely effect causing thus irregular sizing properties?

Other factors which have their origin in the water used such as the degree of hardness, Carbon dioxide, Calcium chloride, ammonia, etc., might cause the paper to have a better sizing on one side than the other, or a sheet of irregular sizing might show up later.

Although it is not possible to draw any definite conclusions as to the fact that one side of the sheet shows a better sizing than the other, quite a few people seem to be sure that this or that factor was the cause.

The factor which is size destroying or of a reactive nature is in most cases already contained in the sheet while the process of the final sizing takes place at a moisture test of approx. 30 to 50 per cent of the sheet, and at a temperature of 80° to ° cent. of the dryers. Naturally this factor will show up first and strongest at the point where conditions are favorable for such reaction.

Supposing that the sizing forms a kind of a thin film between the various bunches of fibre, and further supposing that the destroying influence is of a chemical nature it will be found that the reaction is greatest where the film of sizing is thinnest and adjoining the largest reservoir of anti sizing properties.

The microscope is best suited to trace any size destroying factors of a mechanical nature and origin. Faulty and imperfect preparation of the halfstuff will show under the microscope deep cuts adjoined by steep inclines. The melting size tries slowly to fill up any unevenness and thus rather supports the size destroying tendencies. Thus a swim test on ink will produce on the upper side of the sheet dots of accurate formation or blurred spots.

If such a paper would again partly be moistened to a moisture test of approx. 50 per cent and once more dried at 80 to 90 cent. such a treatment would cause additional shrinkage and consequently a better degree of sizing.

Every paper needs an individual treatment with regards to manufacturing, testing, and last not least as to sizing. No iron clad rules or regulations would be advisable.

Although there has been quite a lot of progress made of late both in the manufacture of size as well as the use of same still there seems to be quite an amount of secrecy about it. All endeavours to better conditions along these lines will be welcome.

ALCOHOL FROM SPENT SULPHITE LIQUOR.

At the last meeting of the Norwegian Sulphite Association, G. Landmark gave a rather interesting lecture on the experiments and tests in connection with Alcohol reclamation from Spent Sulphite Liquor conducted by the Sulfitspirit Co., Ltd., at Drammen, Sweden.

These tests yielded 1.26 volume per cent. of Alcohol reclamation, and it is hardly possible to get better results.

As far as economy of such an undertaking is concerned, it was found that the required plant for reclamation of alcohol from spent Sulphite liquor proved to be a success in every way.

It might be taken as a basis that in a mill with a yearly production of 1,500 tons—air dry—of Sulphite Pulp approx. 6 to 7 cbm. of spent liquor per ton of dry Sulphite can be used for reclamation. Of late it has been claimed that even as high as 10 cbm. could be taken which would result in a still better efficiency of the plant.

Counting on cbm, a yearly production of 1,080,000 liters of 100 per cent. proof alcohol could be effected while 7 cbm. would yield 1,200,000 liters yearly. Such a plant is estimated to cost approx. Kr. 200,000 (\$7,000,000). The costs of production are 9.68 ore = 2.78 and 8.72 ore = 2.51, based on 6 and 7 cbm. spent liquor per ton respectively.

The Sulfitspirit Co., Ltd., of Drammen (Sweden) has bought the patent for this process.

White Water

In many paper mills the loss of fibre and other paper making materials in the white water amounts to from 10 to 30 per cent. of the paper made, the percentage loss depending on the equipment of the mill and on the kind of paper made.

This loss can, in most cases, for a very low cost, be cut down to two per cent., under favorable conditions, even to one per cent., or less.

Why waste all that expensive material?

White water tanks of ample size are in most cases a necessity for a good result. Those can either be conical with a baffle plate in the middle for small machines, or, for large machines, oblong, with sides inclined so as to force the settling materials to work down to a spout in the middle of the tank, through which they by mechanical arrangements are conveyed towards the outlet for the water going back to the mill.

Several settling tanks or tank save-alls are on the market, but they are usually expensive in first cost, and in maintenance, and do often need much attention. A main thing with a settling tank is that it can easily be cleaned out.

To give a good settling action in the settling tank it is necessary to have the white water flowing in gently and the mechanical arrangements conveying the settled materials in the oblong settling tank to the outlet for the water going back to the mill, must be run at such a speed that the white water is not stirred up, and still at such a speed that it carries the materials forward.

The surplus white water should discharge from the tank as far as possible from the inlet, and as an overflow, and at a place where the white water is purest.

Paper machines, wet machines, etc., should be erected so that oil and other impurities round the framework does not run down into the machine pits, thus making it possible to let all this water go back to the white water tank.

The only fresh water necessary round a paper machine is for the spray pipes for the ends of the suction boxes for starting up after emptying the white water tank and for washing up hoses.

Spray pipes usually consume far more water than is necessary for the proper cleaning of the wire, either by too coarse a perforation or, still worse, if they are provided with two rows of large holes.

What is said above regarding paper machines also holds good for mechanical and chemical pulp mills. Spray pipes on wet machine felts and hoses for cleaning, as well as water for starting up, are the only places where white water is necessary. Spray pipes on screens, grinders, etc., should be arranged so that they can be supplied with white water without being solved. A surplus of white water can also, for respective mills, be used for washing the pulp in sulphite, sulphate, and soda pulp mills.

Wire and felt spray pipes can also be supplied from the white water tank by separate pumps where the settling tank white water is clean and free for fibres. The outlet for this purpose should be located near the middle, but at a level which always will give an ample supply of water. An ample screen arrangement should be provided to prevent coarse particles to follow the white water and make the spray pipes.

In most cases a large percentage of ground wood pulp escapes in the paper, and the quantity of filling becomes so small, which better increases the settling action to a very much considerable amount of

ground wood pulp fibres escape in the waste white water.

This overflowing white water should, therefore, pass through cylinder-mould save-alls, provided with a wire finer than that of the paper machine by 10 to 20 mesh.

When paper is made from chemical pulp without filling the settling tank is of little or no use, and the cylinder mould save-all takes its place to recover the fibre in the waste white water.

All this equipment will, however, only partly serve its purpose if the white water end of the mill is not properly looked after.

If hoses, the necessary supply of fresh water for starting up and other fresh water supplies round the mill, which goes to the white water tank, are left open when not needed, the amount of white water going to waste increases, and as also the clearest white water carries some materials, this should be avoided.

To have a check on this at all times an automatic recorder should be provided, showing the amount of white water flowing away. This recorder should preferably be located in the superintendent's office in order that the superintendent in charge has the record before him, and can investigate the reason for too large an overflow of white water whenever this occurs.

An investigation from time to time, or continuously, of the quantity of materials going to waste in the white water should be conducted, mainly in order to find out whether there are any undue escapes of materials somewhere in the mill, but also to determine the actual loss of materials compared with the production.

By utilizing the fine fibres and other materials in the white water, a very much closer woven sheet of paper is obtained, especially where coarser paper like news, manilas, and similar papers are made, but the greasier pulp tends to give trouble on fast-running paper machines.

It is of large importance that dirt is kept away from the white paper, as once there it will to a large extent go into the paper.

PRESIDENT AMERICAN WRITING PAPER CO. SELECTED

(Special to Pulp and Paper Magazine).

Arthur C. Hastings, who has been president of the American Paper and Pulp Association for several years and who retired from that position at the annual convention on February 19, is going with the American Writing Paper Company of Holyoke, Mass., as president. This will be formally confirmed at the directors' meeting to be held on May 5.

Mr. Hastings will reside in Springfield, Mass. During last week he was at Holyoke and Springfield visiting the company's mills. He returned to New York on Friday evening.

The American Writing Paper Company has been without a president since the retirement of W. N. Caldwell several weeks ago. Mr. Caldwell was made chairman of the board of directors and Alfred Leeds became general manager. Mr. Hastings is a man of wide experience in executive capacities. He is president and general manager of the Cliff Paper Company of Niagara Falls, N. Y., and is now president of the United States Paper Export Association, Inc., of pleasing personality and forceful character. Mr. Hastings' many friends in the trade are confident of a most successful career in his new position.

SALE OF TIMBER LIMITS

The sale by auction of the timber limits of Messrs. H. M. Price & Co., lumber merchants, Quebec, now insolvent, will be held on August 5th next, at the offices of Messrs. La Rue & Trudel, accountants, 120 St. Peter street, Quebec. The limits include a total of 527 square miles, along the rivers St. Jean, Saumon, Magpie, and Chambers; also a certain area of freehold land to be used as a mill site. Particulars regarding the properties and conditions of sale are given in another column.

UNION BAG & PAPER CO. ANNUAL

The Union Bag and Paper Company held its annual stockholders meeting at the corporate office of the company, Exchange Place, Jersey City, N. J., on April 14. Guy Morrison Walker and John A. Kimberly were elected to the directorate to fill vacancies. A resolution was passed authorizing the president to appoint a committee of three, of which he should be one, to formulate a plan for the development of the company's resources and to improve the company in every way. The meeting was adjourned until June 16, when the special committee's report will be received.

Immediately following the stockholders' meeting the directors met and elected the following officers: John S. Riegel, president; Charles R. McMillen, vice-president, in charge of sales; John A. Kimberly, vice-president in charge of manufacturing; E. S. Coleman, treasurer, and E. B. Murray, secretary. Mr. Murray is the only new officer, his former position being assistant-secretary, but he acted as secretary during the past year.

The committee appointed to work out the details of the plan for improvement and a constructive policy consists of John S. Riegel, president of the company; Guy Morrison Walker and August Heckscher, directors. Metropolitan dailies misinterpreted the purpose of this committee, which was not to the extent of conducting an investigation of the financial affairs of the company.

President Riegel's address to the stockholders is given in full below:

April 14, 1914.

Ladies and Gentlemen, Shareholders of the Union Bag and Paper Company,—There is little to be added to the remarks contained in the communication mailed to you by the Stockholders' Committee under date of March 20th last, and my own communication under date of March 21st. These two statements, taken together, set forth the affairs of the company quite as well as I could put them before you now.

In regard to the condition of business, it remains quiet and below normal. The selling price of bags is somewhat higher than it was a year ago. It is rather difficult to forecast what the result of these two conditions will be in the way of money profits.

The company, in order to show adequate earnings, stands in need of two things: First, the development of its Canadian properties; and second, modernizing its older manufacturing plants in the United States.

As to the Canadian property, which was acquired in 1905, very little money has really been expended for development work. The building of water power and conducting lumbering operations require a vast

amount of capital, and we really have placed in Canada scarcely 10% of the capital needed there to carry the properties of the company located on the other side of the border line to their complete development.

I think we should begin without delay to institute plans looking towards the development of these valuable Canadian properties. It must be remembered that, even though plans were in hand and funds as well, several years would pass by before the actual construction work could be completed.

More closely at hand, and in the minds of the management, is the condition of certain of the manufacturing properties in the United States.

I am quite certain that if your management had in hand, say, one million dollars, to expend on plants, that we could earn in a very short while four or five times the interest on such a sum.

It seems to me that the shareholders of the company should give careful thought to this phase of the situation.

I now have the pleasure of leaving the meeting to you.

The following resolution was unanimously adopted at the stockholders' meeting as a result of the foregoing address:

"Resolved, that whereas the management of the company has stated the need of funds for the improvement of properties; and, that, whereas, the credit of the company is influenced by the great disparity between the selling price of its Preferred and Common Stocks and the par value thereof:

Therefore, be it resolved, that a committee of three be appointed by the president, of which the president shall be a member, to consider constructive plans for the development of the company, and to report back to the stockholders any recommendations that they may have to make forty-five (45) days after the date of the annual meeting, or about June first.

Be it further resolved, that this meeting be adjourned until June sixteenth, on which date it shall meet again at the offices of the company, at 15 Exchange Place, Jersey City, at 11 a.m., to take action on any recommendations that may be made by said committee, and that a copy of this resolution be mailed immediately to stockholders of record."

BELGO-CANADIAN PROGRESS.

The Belgo-Canadian Pulp & Paper Company is making progress with plan enlargements. The new sulphite plant of a capacity of 50 tons daily will be ready in October or November. The new paper machines of 60 tons capacity will not be ready until March, 1915; the present output is 120 tons per day. Mr. H. Biermans, managing director of the company, who has just returned from a visit to Belgium, says monetary conditions in Brussels are cheerful. "Our own financing of the paper company's extension, of course, was completed last year when we made a successful issue of 8,000,000 francs in 5 1/2 per cent. bonds at par," remarked Mr. Biermans. "We had some other projects in view, but it was useless to suggest anything new in Brussels. Bankers there did not want terms of the new propositions. Money is scarce and confidence somewhat disturbed. Government loans are now to be had on as high as a 5 1/2 per cent. basis, and investors temporarily are putting their money into such issues."

TO APPEAL GERMAN PULP DECISION.

The United States Government has ordered that an appeal be taken to the United States Customs Court of Appeals in the matter of German wood pulp made from Missouri wood. The Treasury Department notified the Assistant Attorney at New York that an appeal was made on April 8th. The letter, as addressed to the Assistant Attorney, says in part:

"Certain wood pulp manufactured in Germany from wood grown and cut in Germany and Finland, but not in Russia, was free of duty under the favoured nation clause of the treaty with Germany. File an application with the U. S. Customs Court of Appeals against the decision of the Court of General Appraisers."

The B.C. Royalty Act

The following letter relative to the recent Timber Royalty Bill, passed at the last session of the British Columbia Legislature, has recently appeared in a number of newspapers in the United States. The letter was sent out by the Forestry Department at Washington:

"The Canadian Province of British Columbia is showing the way to all other governments in the matter of doing things for the common people. The B. C. Legislature passed a law introduced by the Minister of Lands, Hon. Wm. R. Ross, which assures to the citizens of that province an income, within ten years, of three million dollars a year from royalties on publicly-owned timber. This Act, according to information which comes to interested public men in Washington, does for publicly-owned timber in British Columbia, what the conservationists, under the leadership of Gifford Pinchot, have been trying to secure for the people of the United States.

"The Act retains in the Provincial Government, for the people, the fee simple title to all timber lands; it permits the taking of timber claims one mile square at an annual rental of \$120 per claim, and for the payment to the government of a stumpage price which rises gradually with the increased value of timber. Under the old Act of 1905, the stumpage price per thousand feet was 50 cents. The new Act increases it to 75 cents a thousand feet, effective in 1915, and provides that five years later there will be added to the royalty price 25 per cent. of the increased value of lumber at that time, above a minimum price of \$18 per thousand, each five years thereafter the same thing will be done again, the percentage taken by the government to increase gradually from 25 to 40 per cent. the whole arrangement covering a period of 40 years.

This means first, that the lumbermen get a reasonable profit out of their operations, the government takes nothing unless the price is above \$18 a thousand. It means further, that the government, the people share in the increased value of their timber. It establishes a great profit-sharing, co-operative principle in which the government and the timber operators are partners. The government retains the timber, the land, and their right to prescribe the way in which the land shall be used. The people's interest is increased and in the near future lumbermen are encouraged to clear, maintain and develop the timber lands."

"The great lesson for the United States in this B. C. Royalty Act lies in the recognition by the Provincial Government that the people should share in the increasing value of their own property—a principle which American conservationists under the leadership of Pinchot, have been and are fighting to have enforced in the development and use of public water-powers in the United States."

Bamboo Paper Pulp

According to the United States Consul General in Hong Kong, the matter of developing this industry in India has been discussed in the Indian Forest Records by officials concerned in the utilization of the forests of India, the report being designed to afford data for action on the part of investors. To secure definite facts for the purpose a considerable number of localities known to have large growths of bamboos were selected, and information was secured from them as to the various species of bamboos to be had, their respective advantages for the commercial manufacture of pulp, possible advantageous sites for factories, the cost of transport, cost of labour, and similar data. Five places in Lower Burma and six places on the West Coast of Southern India were selected as localities especially favourable from the standpoint of raw material, transport facilities, and available markets. The enterprise in India seems to hinge largely upon the question of satisfactory and cheap transportation. Two notable factories have been established for the pulping of bamboos, one by the Mitsu Bishi Goshi Kaisha in Formosa, and the other by a Hong Kong corporation near Haiphong, in Indo-China. The last-named concern best represents the commercial phase of the business. The company was organized about three years ago, and the plant was purchased in Scotland. The installation was considered complete about a year ago, and an attempt has been made during the past year to manufacture pulp. The second plant of consequence in this industry, that of the Mitsu Bishi Goshi Kaisha, in Formosa, has been in operation a little over a year. It was established after years of experimenting. The entire output of the factory is used in the paper mill of the same company at Takasago, Harima, Japan. It appears that the bamboo pulp is more expensive than ordinary imported pulp, but that it is suitable for the manufacture of Japanese paper of high quality, and that its use is fairly profitable for such special purposes under the conditions obtaining in Formosa and Japan, and with the same company working the pulp mill and the paper plant. The critical feature of the entire enterprise seems to be in the matter of bleaching the pulp. Experts claim for bamboo pulp certain advantages, among which is the fact that bamboo pulp can be had in parts of the world where other materials are not to be had; it can be made with a regular land crop, controlled by the pulp factories, which can be produced in any amount in three years; it is usually accessible to water or other cheap transportation; it produces a fine pulp, which felts readily and produces a thick, opaque paper of greater thickness than usual for its weight, making it especially suitable for particular varieties of paper; the fine, flexible fibre is easily digested by the ordinary bisulphide process, and the bamboo can readily be handled mechanically and chemically.

IRON IMPURITIES IN PAPER

By Harry A. Maddox

(Written specially for the Pulp and Paper Magazine).

Iron compounds, spots or particles, form one of the chief classes of impurity present in many grades of paper. Exceedingly few of the cheaper varieties are free from iron in some shape or form and more often than not its presence represents an impurity. The subject is not a very serious one in the case of these low grade products, but when fine papers, and particularly white printings and writings selling at a good price, come up for consideration, it must be admitted that the intrusion of iron and its compounds constitutes a problem of great importance. Much has been written, in a scattered way, about iron in paper, how it gets there and how to detect it, and to some of these notes we must acknowledge our indebtedness for part of the information here set forth. Our object has been to compile sufficient data on the one subject to form a fairly comprehensive treatment.

Wood itself is practically free from iron in any shape or form, but the finish of a high class paper demands the inclusion of a certain proportion of rag stuff. Rags, according to their origin and condition, contain iron bodies varying in character, composition and amount. Portions of old and used garments frequently bring into the mill such miscellanies as hooks and eyes, steel buttons, clips and fasteners, etc. The dust from old cotton rags has been found to contain as much as 65 to 70 parts of iron per 100,000. In this connection it may be noted that an experiment with a magnet among the dast is likely to give conclusive evidence of the presence of minute particles of the metal in many instances. Much may be done toward ridding the obtrusive element by cutting and vigorous dusting of the rage, accompanied by careful sorting and picking. In the case of the highest grade paper, if there is any doubt about the freedom of the rags from attachments, hand cutting represents the best method of control. Colored rags, which have been dyed by the aid of iron modants should be eschewed, save for middle and low grades. It is difficult to eliminate the firmly fixed salts from the fibre.

Tests for the presence of iron in the raw material may be carried out by digesting the rags in pure, dilute hydro-chloric acid and treating the extract in the manner shortly to be described under another sub heading.

Another source from which iron bodies are derived, usually in the form of ferrous bicarbonate is the water supply. Ultimately the ferrous compound becomes oxidized to the ferric state. Cellulose readily absorbs iron salts from its solution, and as this applies to any form of cellulose, the presence of iron compounds in the water is of much importance to all papermakers. The probable effect of the introduction of the body in the foregoing manner is to lower the ultimate tone or color of the product. This discoloration may not become apparent for a considerable period after leaving the mill, but directly the paper comes into contact with conditions favorable to organic reaction, the impure ingredient plays its part in the degradation process. Apart from the possibilities of iron salts coming in with the original water, there is also the danger from storage reservoirs or settling tanks, which may consist wholly, or in part, of iron.

Iron in water is chemically expressed as so many parts per hundred thousand, and for good quality papers this proportion should not be allowed to exceed 20 parts per 100,000. Periodic tests will show some variation in the content, but if the proportion runs unduly high further investigations should at once be made into the cause. A rough qualitative test for the presence of iron consists in adding a few drops of nutgall tincture to the water. If the liquid remains colorless, iron may be taken as absent therefrom, whilst if it is present, a dark coloration ensues, varying in depth according to the amount of iron contained. To the papermaker, however, the quantitative test is infinitely of more importance and value, for it is the amount of iron in the water that is the main factor. This tests depends upon the usual Prussian blue formation through the medium of potassium ferro-cyanide and its reaction upon the ferric compound. It is carried out according to the following procedure:

Prepare a standard iron solution by dissolving 0.861 grammes of iron alum in 1 litre of distilled water. This solution should then be labelled to contain 0.1 grammes of iron per litre.

Evaporate now 500 cc's of the water under test to dryness after adding a few drops of nitric acid, free from iron. Dissolve the residue in 50 cc's of pure water, pour this solution into a Nessler glass and add 1 cc of very dilute potassium ferro-cyanide. The blue coloration that ensues denotes iron, and it is now required to gauge the quantity. To effect this, match up the blue color by adding to 50 cc. of distilled water in another cylinder a known volume of the standard ferric salt, a few drops of nitric acid and 1 c.c. of the ferro-cyanide solution.

From the resultant data calculate out the amount of iron in parts per 100,000, which equals $N \times 0.02$, where N represents the number of c.c.'s of the standard iron which corresponds to the iron in 500 c.c.'s of the water.

This mode of testing for iron holds good for the determination of the presence and extent of the impurity in rags, clay, alum, finished paper, etc., therefore any succeeding mention of test must be referred back. According to Klemm, the yellowing, or darkening of color, in modern sorts of printing paper is largely due to the presence of organic compounds formed between the resin used for sizing and the iron salts contained in the precipitant, namely, sulphate of alumina. Schoeller, however, refutes this on practical evidence, for he has proved that iron plays a negligible part in the reaction unless present in considerable quantity. Resin itself has been shown to alter the white color of the paper containing it to a sandy tone by oxidation on exposure to heat, light and air. Theoretically, iron does not exert any undue influence unless present to the extent of 0.04% in the form of resinates, calculated upon the total resin present. This amount is far in excess of what might be expected from alum under any ordinary conditions.

The probability of iron compounds finding their way into the ultimate product from other sources must be taken into consideration, when it may be found that the stipulated minimum of ferric bodies might be closely approached, if indeed not exceeded.

Alumina of good quality should be entirely free from iron residues, but many of the cheap grades will be found to contain a dangerous amount. Aluminium sulphate from china clay contains about .0025 per cent. of iron in the best grade, less than 0.2 per cent. in the second grade and considerably more in the low grades (Stearns).

According to another authority as much as 0.15 does no harm in high grade writing or printing papers, while over that amount tends toward a paper that will lose its color purity in exposure. The presence and amount of iron in alum may be detected by acidifying the solution with iron free nitric acid and carrying out the aforementioned test. Another quick qualitative method for determining the presence of iron is to treat a small portion of the alum, dissolved in hot water, with an excess of pure potassium hydrate. The addition is made while the solution boils, and for some little time afterwards the boiling point should be maintained. If iron is present in an inorganic form, it separates out as a flocculent brown precipitate.

Papermakers lays frequently contain iron in more or less amount and it is advisable to exercise a regular control over the various consignments of clay as they arrive. The embodiment of iron compounds in large amount is not to be expected owing mainly to the adverse influence on the color. The better grades of china clay never contain an appreciable amount of iron, but the low grades may often carry traces sufficiently powerful to ultimately deteriorate the manufactured product. A test may be undertaken by extracting with pure hydrochloric acid and proceeding with the colorimetric determination as before.

Metallic spots in paper are a well known source of degradation to otherwise fine grades of stock. These spots may be copper, bronze, lead or iron, but we are only here concerned with the last mentioned. Even the iron spot may occur in several forms, e.g., metallic, iron, iron oxide or rust, organic iron, or rather compounds of iron and grease. Such like particles may find their way into the paper from the water supply, the various pipes or tanks through which the water or stuff passes, or in which it may stand temporarily. Probably the most fruitful source of iron particles is the beater or refiner, i.e., when steel bars or bedplates are in use. Particularly does this apply when the knives on the roll are composed of harder metal than the bedplate, or vice versa, for then chipping is continually going on. Even if the danger from chipping is reduced to a minimum the introduction of rust spots may not be overcome. The wet steel oxidizes, absorbs carbonic acid gas, and thus forms a rusty surface, which, being brittle and loose, falls away in fragments among the next lot of stuff. Brass or phosphor bronze is recognized as the superior metal for beaters, refiners, etc., but if steel is preferred it should be carefully and thickly painted over with one of the patent rust preventing paints on the market. Of course, the layer would not extend to the cutting edge, otherwise another and worse type of spot would be promoted. Iron particles in paper have been known to arise from defective connectors and worn bearings, undue friction often being the responsible agent for the deterioration. Probably the best method for removing the iron particles when they precipitate in the pulp prior to its flow on the wire is to install a powerful array of removable electro magnets in the headbox. Ordinary magnetic separators do not produce direct result, but unless they are carefully cleaned and arranged their efficiency is reduced.

To test for iron spots in paper, first examine the defect closely in order to ascertain its nature. If black, opaque, and glistening in the centre, there is no doubt the impurity is metallic iron. A reddish or brown coloration, with possibly a dark shaded centre is characteristic of iron oxide, or rust. This form of iron spot is more commonly met with than the metallic variety, for the latter usually meets with damp, heat and carbon dioxide, which are the agents responsible for speedy oxidation of iron. Even the travel over the wire and through the cylinders and calendars of the paper machine is sufficient to transform the metallic particles into the oxide in most instances.

To determine whether doubtful spots are iron or other metal, pour over the place a drop of potassium ferro-cyanide, which with iron will produce a blue coloration. If a brown stain results, the spot is evidently copper or bronze. Occasionally, iron spots surrounded by grease or resin are met with. To identify these, dissolve out the greasy matter with ether or alcohol and apply the blue color test.

Obviously the problems of iron in paper are of serious import to the makers of fine grades of writings and bookpapers. It behoves them to exercise a strict watch over the introduction and presence of iron in any shape or form if a product of purity and durability is to be turned out.

U. S. Imports during February

(Special to Pulp and Paper Magazine.)

Washington, D.C., April 26, 1914.

According to the figures of the Department of Commerce, imports of paper into the United States during the month of February amounted to \$1,998,835 in value, an increase of \$417,112 over the corresponding period a year ago. Imports of paper and its manufactures during the eight months ended February 28, totalled \$18,087,339, as against \$14,271,080 and \$11,983,295 imported during the corresponding periods of 1913 and 1912 respectively.

Importations during February of newsprint paper amounted to 43,934,045 lbs. valued at \$864,483, as against 26,042,043, valued at \$525,066, imported in February, 1913. Of this amount 43,196,468 lbs., valued at \$831,458, came in free of duty, an increase of 20,777,700 lbs. over the free entry of a year ago.

Wood pulp imports during February, 1914, fall somewhat shy of those of February, 1913. The figures follow:

	Feb., 1914.		Feb., 1913.	
	Quantity.	Value.	Quantity.	Value.
Mechanically ground.				
Free ..	20,066,477	\$ 148,812	13,994,046	\$ 111,739
Duty ..			3,178,330	25,288
Chemical unbleached.				
Free ..	53,000,348	883,554	4,262,501	79,635
Duty ..			60,656,260	960,726
Chemical bleached.				
Free ..	11,347,545	271,780	799,059	21,449
Duty ..			18,941,713	424,525

Total .. 81,445,370 81,301,116 101,841,909 \$1,623,362
Pulp wood importations, however, showed a slight gain over the preceding year, there being 83,373 cords, valued at \$501,802, brought in during February, 1914, as against 66,373 cords, valued at \$409,276 imported in February, 1913.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

London, April 20, 1914

The Anglo-Newfoundland Development Co., Ltd., of London, who are proprietors of the large paper and pulp mills in Newfoundland, have contributed \$4,800 to the fund that has been raised to help the widows and distressed dependents of the Newfoundland sealers who lost their lives in the recent disaster.

British Paper Makers' Association.

The annual meeting and the annual banquet of the British Paper Makers' Association will be held on April 23rd in London. Elaborate arrangements have for some time past been made for the event, and it is quite certain the question of the workers' union label—the adoption of which requires all mills to be transformed into a trade union mill—will occupy a prominent place in the meeting's agenda.

Paper Imports.

The Trade Board returns for March show a small increase in the British imports of paper from all countries. The following are the figures:

	1913 Cwts.	1914 Cwts.	1913 £	1914 £
March . . .	989,922	1,062,749	577,117	638,657
Jan.-Mar. .	3,030,311	2,990,748	1,806,883	1,845,117

Printing and writing papers on reels were imported to the extent of 135,906 cwts., as against 133,067 cwts. in March, 1913. No supplies were received from Newfoundland. Printing and writing papers not on reels were imported to the extent of 77,842 cwts., compared with 80,824 cwts. during March last year. Paper hangings reached 6,325 cwts. compared with 5,544 cwts., coated papers 8,374 cwts., compared with 8,210 cwts., and packing and wrapping papers 373,440 cwts., as against 324,824 cwts. in March, 1913. Germany enjoys the largest trade with England in paper hangings, whilst Scandinavia does the biggest business in all the British markets in cheap news print and cheap writing paper. Canada is a large exporter of wood pulp boards to the English, Irish and Scotch markets. The imports from all countries in March reached 117,077 cwts., compared with 97,254 cwts. in March, 1913. Makers of boards in the Dominion should note this substantial increase inside of a year, and every effort should be made to capture a little more of the trade that is going. Canadians will always be given first consideration before any other foreign country, but the British buyer wants a traveller to call upon him and one who will be able to give him terms nearly as good as the foreigner. This can easily be achieved if the right way is adopted.

British Exporters.

For the first time this year the British exports of paper of all kinds, including cardboard, show an increase. The following are the figures:

	1913 Cwts.	1914 Cwts.	1913 £	1914 £
March . . .	282,791	302,705	310,964	313,820
Jan.-Mar. .	894,038	895,474	956,707	920,116

Writing papers reached 16,141 cwts., a reduction of 3,458 cwts., when compared with March, 1913. Printing papers also show a reduction of 4,170 cwts.—156,-

238 cwts., compared with 160,408 cwts.—while packing and wrapping papers rose to 85,362 cwts., comparing decreased by 2,335 cwts.—14,751 cwts. compared with 16,906 cwts.—and coated papers by 727 cwts., with 16,906 cwts.—and coated papers by 727 cwts., the figures being 2,062 cwts., as against 2,789 cwts. in March, 1913. Pasteboards, millboards, and card boards were reported to the extent of 9,539 cwts., an increase of 2,417 cwts., and paper bags to the extent of 5,058 cwts., as compared with 4,314 cwts. in March last year. The increase in the exports is really attributable to good trade being done in packings and wrapping papers, boards and manufactures of boards, and paper bags. But newsprint, writing paper, paper hangings, envelopes, and coated papers have not yet reached an increase in the export trade returns, which shows that the British mills are still going through a dull spell of trade. Canada imported from England 252 cwts. of writing paper, as against 869 cwts. in March, 1913, and 8,517 cwts. of printing paper, as against 6,650 cwts. in March last year.

Wood Pulp Imports.

The imports of wood pulp into the British market during March were as follows:

	1913 Tons.	1914 Tons.	1913 £	1914 £
March . . .	48,040	39,217	181,582	172,256
Jan.-Mar. .	180,757	167,699	796,945	746,475

The depressed state of the paper industry is largely attributable for the small consumption of wood pulp. Mechanical wet was received as follows: Sweden, 1,208 tons, compared with 958 tons in March, 1913; Norway, 24,113 tons—a reduction of 10,653 tons over March last year—Canada no supplies at all; compared with 505 tons in March, 1913, and other countries nil also. It will be observed by these figures that Norway has been the greatest sufferer, and though there are reports that supplies are not accumulating in that country, it seems significant that mechanical is selling at the price of 32 kroner per ton, which includes agents commission and f.o.b. Since January to March 31st, Canada has reported 5,602 tons of mechanical wet to England, compared with 1,196 tons for the same period of 1913. Other imports were: Bleached chemical (dry), Russia, nil; Sweden, 150 tons, an increase of 61 tons; Norway, 747 tons, a decrease of 493 tons; Germany, 89 tons, an increase of 57 tons. Unbleached chemical (dry): Russia, 930 tons; Sweden, 3,396 tons, compared with 2,923 tons in March, 1913; Norway, 2,779 tons, as against 2,913 tons; Germany, 5,160 tons, compared with 3,539 tons. Norwegian exports are down all round.

Africa's Prospects.

The Pretoria Civic Association has an Industries Committee, and, acting on the advice of that committee, the Association some time ago decided to send to Bertrams, Ltd., the papermakers' engineers of Edinburgh, samples of raw materials so that a paper making industry might be started. Bertrams, Ltd., have made a report, which states, inter alia: "The wild grass is very much superior to the maize stalks and leaves, and unless the maize can be got at a very much lower cost than the grass, we would recommend you to adhere

the grass as it is material capable of making high class paper. . . . We understand, however, that it is now possible to manufacture coarser papers, such as brown paper for wrapping purposes and the like, and we have no hesitation in saying that the grass is an ideal material for this purpose." Samples of pulp from the grass and from the maize stalks have been sent out by the firm, which considers that the samples made from grass treated with caustic soda is the best. From this high-class papers could be made. The firm gives details of a plant which it is certain would give every satisfaction, and states: "We are therefore putting before you a scheme which will produce the paper you require at very much less cost than has hitherto been possible, and the saving to you therefore will be considerable. . . . You will therefore be able to produce paper at a cost which represents great saving over existing methods, and we think therefore that the fairest method of dealing with you in a matter of this kind is that you would pay a royalty for every ton of paper produced. To fix this royalty we think it would be absolutely fair to fix at one-half of the saving that would be made with this process as against any other process you can adopt." Further, the report states: "We are quite prepared to take the whole of the responsibility in connection with the treatment of the raw material, and are quite willing to give you any assistance in connection with this."

Offset Paper.

In England, printers are giving a good deal of attention to paper suitable for what is known as the offset printing press, and it is quite evident that paper mills will have to give the subject serious consideration in the near future. Mr. H. Goldshaw, manager of John Dickinson & Co., Ltd., Home Park Paper Mill, says that papers for use on the offset press and photogravure machines need not necessarily have rough surfaces to gain the best results in printing. He was of the opinion that coated papers would become more general, as they helped the ink to a considerable extent. Coated papers were manufactured in England as far back as 1814, and clay was the chief constituent in the old coated papers, which gave them a dull finish. According to the present-day methods, the results were more satisfactory, as following the clay coated paper came the arrival in quick succession of a blue-white finish, but owing to the bright surface being strongly objected to, further experiments were tried. He was of the opinion that for chromo papers a double coated paper with a fine graining gave the best results for printers; whilst for process work nothing could touch a fairly absorbent surface. He attached great importance to the time allowed for finishing and seasoning stocks of coated papers, particularly where the hot air process of drying was not installed. Americans are now making a specialty of offset papers.

The Burnley Paper Works Co. have declared a dividend of 5 per cent. and the Gandy Bell Co. a dividend of 11 per cent. Messrs. Edward Lloyd, Ltd., report that they are doing a growing business with Canada and the other colonies.

George F. Chaffin, Toronto, sales manager of the Ontario Pulp and Paper Co., has returned after a tour of the pulp mills in the Western and Middle West. He reports business on the coast as being good and a boom was prevailing with regard to

Ottawa Notes

LUMBER FREIGHT RATES INCREASED.

Ottawa, Ont., April 25.—The lumber end of paper manufacturing companies will be affected by the decision of the Canadian railways to increase their export rates on lumber of all kinds from points throughout the Ottawa Valley to Montreal as well as the rates for domestic shipment. This is expected to be the forerunner to a general increase in all rates between the two cities.

Objection to the proposed advance was voiced before the Railway Commission last week by representatives of the Canadian Lumbermen's Association and the Montreal Lumbermen's Association, and after hearing some discussion, the Board reserved judgment. When the case was called Mr. Frank Hawkins, secretary of the Canadian Lumbermen's Association, said lumbermen would like to have an explanation of what the railways proposed to make the increases.

Chairman Drayton pointed out that the issue involved was whether the railways were prepared to disregard water competition between Ottawa and Montreal, hitherto supplied by the Ottawa River and connecting canals. Mr. E. P. Flintoff, counsel for the Canadian Pacific, said that road was willing to disregard water competition.

Mr. Hawkins then told the Board that before May, 1908, the summer schedule of rates on export lumber was 4 cents per 100 pounds and 5 cents per 100 pounds domestic rate, from Ottawa Valley points to Montreal. In May of that year both rates were increased to 5 cents, an increase of 17.36 per cent. Now it is proposed to advance both export and domestic tariffs to 6 cents, or a total increase since 1908 of over thirty-six per cent. The usual 30 days' notice had not been given, and therefore lumbermen who had promised delivery on the basis of the 5 cent. rate stood to lose if the railways were allowed to put this increase into effect in May as proposed.

Mr. J. E. Walsh, of the Canadian Manufacturers' Association, and Mr. W. S. Tilston, of the Montreal Lumbermen's Association, supported this contention, while Mr. Flintoff, for the railways, argued that they were entitled to make the increase. The fact that water competition between Ottawa and Montreal, once an important factor, had now practically disappeared, was, Mr. Flintoff admitted, the principal reason for making the increase.

That this increase in lumber rates would, if it went through, prove only the prelude to a jacking up of rates on pulp and paper between Ottawa and Montreal was the opinion expressed by a well-known member of the trade, and generally shared. The only remedy would be a revival of the shipments by boat along the Ottawa River and connecting canals to Montreal so as to provide water competition once more.

Right to Supply Power Not Allowed.

The status of all pulp and paper companies in Ontario, which seek to export their surplus power is affected by the decision of the Private Bills Committee of Parliament this week with reference to the application of the W. C. Edwards lumber firm, of Ottawa, for wider powers. Senator Edwards, head of the firm, made application to the committee to secure the right to dispose of surplus hydroelectric power which is being developed at the Edwards plant at the Little Chaudiere Falls, but the committee decided not to

grant this right until the Ontario Hydro-Electric Commission had been consulted, as the enlarged powers desired might prove a source of competition for the Commission. The Hydro Electric Commission proposes to enter the power field in Eastern Ontario and several members of the committee held it was right to give a private company powers which would allow it to compete with the Commission in supplying cheap power.

Senator Edwards, in an interview later, said the idea was absurd. He explained that he was president of the Hull and Ottawa Power Company, from which concern the Hydro Electric Commission bought most of the power with which it supplied the City of Ottawa through the Ottawa Municipal Electric Commission.

The High Commissionership.

In connection with the unofficial announcement that Hon. George H. Perley will be appointed Canadian High Commissioner in London, in succession to Lord Strathcona, it is of interest that Mr. Perley was a well known figure in the pulp and paper trade before his retirement from active participation therein. He succeeded his father as a member of the firm of Perley and Pattee, and later merged his interests with the Riordon Pulp and Paper Company, of Hawkesbury, Ont. Born in the United States, it is said that Mr. Perley will have to take out naturalization papers in England if he goes there, or will otherwise be considered as an American citizen.

"MAC."

Envelope Papers with Malachite Mottling

Envelope papers having long mottling fibres of chemical pulp, bast, cotton fibres could formerly be made with a speed of the machine of only about 35 m. For modern manufacture with high speeds of the machine up to 70 m. the following considerations come into question:

Dyeing—For dyeing mottling fibres hardly any but diamine dyes come into question, because they are exceedingly stable to light, air, water and friction. In addition, they possess great fixing power. They are dyed in the beater or in the edge-runners.

Dyeing should be effected in the beater only in case of emergency and with chemical pulp made from the wood of coniferous trees. Jute rags are cut, removed from dust, boiled with alkalies and washed in the pulping engine. The unravelled long-fibred half-stuff is emptied into the draining chest. The dye freshly dissolved in water is added hot to a mixing engine with a high density of pulp heated to about 40° C. After being well mixed add 10% dissolved denaturated sodium chloride or an equal quantity of calcium Glauber salts or twice the quantity of crystallized Glauber salts. After heating to about 60° C. add 2% alumina sulphate. Generally 3—4% long mottling fibres are added after the sizing shortly before the emptying.

First add the alum solution and then the dyeing solution in the edge-runners and provide for a thick charge. Viscose sizing and an addition of some potato starch have proved very satisfactory. Cotton is generally too expensive. It is dyed in the beater.

The mingled pulp is loosened by means of refining machines after the dyeing in order to diminish the length of the fibres. The fibres then agglomerate

less. Instead of only one rotating strainer three or four thereof will be employed in order to be able to deal with the quantity of pulp requisite for the rapid operation of the machine without disturbances. A large quantity of diluting water facilitates the sorting. The long fibred mingled mass should be charged into the beater only 10 minutes before emptying and should be only whipped and mixed. The sand-strap must be conveyed with a metal plate which is provided not with slots but with round holes. Without this arrangement the most beautiful marble fibres frequently remain in the sand trap. On the machine it is preferable to work with two dandy-rolls in order to press the marbling fibres in well. The supercalanear should have as many rolls as possible (up to 14) in order to obtain sufficient finish without having to fear transparency.—Der Papier Fabrikant.

The Late W. T. McLaurin

The death last week of Mr. Wilmer T. McLaurin, proprietor of the McLaurin Lumber Company, of Montreal, came as a great shock to his many friends in the lumber and paper industry. Mr. McLaurin's



death followed after a short illness. A few days previous to his death he had contracted a severe cold and pneumonia settled in.

Mr. McLaurin was born in Pembroke, Ont., and was about fifty-five years of age. He is survived by his widow, two daughters and three brothers.

Mr. McLaurin was one of the best known business men in Montreal and was exceptionally well-known throughout the lumber industry. He was connected with many fraternal institutions in the city of Montreal. He was vice-president of the St. George's Club at his death, and had been a member of the Caledonia Curling Club for the past twenty years.

Belt Driving

Mr. W. Berry has recently read a paper on this subject before the Birmingham Association of Mechanical Engineers.

Belts are no longer made from leather only, and the first problem is the choice of a suitable material. Mr. Berry favors leather for indoor working in a dry atmosphere, and cotton, canvas, or rope for moist or outdoor conditions. The size of the belt and its duty must also be considered. Leather does not lend itself well to making wide belts nor very thick belts. For these larger drives a woven belt is practically necessary. For small machine belting leather answers very well. In case of breakage or stretching it is readily repaired or shortened; more so than canvas or other woven material. Failures in stretching, however, indicate that the belting is not working under satisfactory conditions. Probably the belt is much overloaded, and a new belt or new driving arrangement is desirable. Occasionally it may be possible to use a wider belt, but it is very rarely desirable to employ a thicker one or to work with a double belt. Thick belting and double bands are particularly undesirable on small pulleys owing to the severe bending stresses set up in them as they pass over the pulleys. If at all possible, the best procedure to adopt with a weak belt is to increase the size of the driving and driven pulleys, so that the belt speed is increased, and the necessary driving force exerted by the belt correspondingly increased. In this country it is the usual practice to run leather belts with the soft or flesh side against the pulley. In America, the reverse practice is not uncommon. The English practice seems the more reasonable. When passing round a pulley the outer face of the belt is subject to an increased tension, and it seems desirable, therefore, that the outer face should be stronger, which is the hair or smooth face of the leather. Then, too, the soft side of the leather gives a better friction grip on the pulley face, and slipping is less likely to occur. It is true that the soft side will wear more rapidly than the other, but this wear does not reduce the strength of the belt in the same proportion.

Mr. Berry does not appear favorably impressed by steel belts, and it may be admitted that for ordinary machine driving they are not at present very suitable. Their best field is that of the main drive, where large powers have to be transmitted. As a rule, the steel band runs on rubber or cork faced pulleys, and hence a very high coefficient of friction is obtained. Owing to the high tensile strength of steel, very thin bands can be employed, and these can be run at high speeds. Indeed, speeds up to 100,000 feet per minute are being employed, but English engineers would prefer to keep below 7,000 feet per minute, because of the high centrifugal stresses in high-speed pulleys. Steel bands reduce the width of the belting and pulleys, and in the case of large powers an appreciable saving in floor effects. Further, the life of a steel belt should be very great, although as a set-off, the life of the steel or rubber facing could be very low. Experience with these belts is still very meagre, and no experiments will be well advised to watch their progress carefully. Difficulties and objections arise before one is very long in the direction, but experience and perseverance may overcome many of them.

At first sight it seems reasonable to encourage friction

between the belt and the pulley. There are, however, modifying influences at work, and the maximum friction is not much better than no friction at all. A driving belt has a tight side and a slack side. The difference between the tensions on these two sides is, of course, the net driving force. The resultant pull on one or other of the belt pulleys is the resultant of these two tensions, and is rather less than their sum in amount. According to the accepted laws of solid friction, the maximum friction is a constant friction of the total load, and from this some engineers have questioned the text book formula, that the maximum difference between the belt tensions on the tight and slack sides, increases with the arc of contact. There is, however, no doubt that the friction does increase with the arc of contact, and, without resort to mathematics, the explanation is simple. The friction is proportional to the total load at right angles to the pulley face, and this load is not the same thing as the resultant or net total load on the pulley. Thus, assuming a uniform tension in the belt, it is obvious that the pressure per square inch of pulley face is uniform and independent of the arc of contact. Hence the total load will increase in proportion to the arc. When, as in practice, the tension is not uniform, the ratio of to arc of contact alters, but the general nature of the result remains unchanged. There is another reason why a long arc favors a high driving force. Some air is always drawn in between the belt and pulley face, and acts as a lubricant until more or less completely squeezed out. Obviously, the longer the arc of contact, the bigger the proportion from which the air has been squeezed. One would expect this air lubrication to be more important at high than low belt speeds, but no actual experimental evidence seems available.

Friction between a belt and a pulley is important in another way. Since the tension in the belt varies, it follows that the belt extends in length on passing from the slack to the tight side. Such expansion involves "creeping" on the part of the belt, and this represents a true frictional loss. The amount of the creep is determined by the weakness of the belt and the net driving tension. Obviously an overloaded belt will have a large creepage loss apart from any bodily slipping of the belt. Further, the wear on the belt is due to creeping and slipping. If well-designed, slipping should be practically non-existent; but creeping can only be reduced to a limited extent. Hence to minimize wear, the pulley must should be as smooth as possible. The necessary adhesion between the belt and pulley should be the result of the natural qualities of the materials, and not due to rough surface.

Mr. Berry gives a simple rule for single leather or woven belting of usual thickness, from which the power transmitted can be calculated. He adopts a net driving tension of 44 lb. per inch width of belt. If a light double leather belt be employed this load may be increased by 25 per cent., and if a heavy double belt by 60 per cent. The above rule gives larger belts of lower powers than other rules widely followed in practice. Something also depends on the joints in the belt. A well-constructed joint is distinctly stronger than a laced one, and will carry higher loads, but laced joints are more convenient, and are in more general use. For good of all, however, belt widths and speeds are generally fixed by the machine makers, and the user has little choice, except in the direction of using weaker belts, generally a quite undesirable policy.—Paper Making.



UNITED STATES NOTES

As the result of a two days' conference the St. Croix Paper Company operating pulp and paper mills at Woodland, Me., signed a two-year agreement with its men granting increased wages and giving other concessions. The agreement is similar to that recently made by the Great Northern Paper Co. with the men at its three mills in Maine, and becomes operative on May 2. The average wage advance is about 11 per cent. for the 61 papermakers, 10 1-2 per cent. for the 175 pulp and sulphite men, and about 10 per cent. for the mechanical men, helpers, etc.

* * *

The Atlas Paper Stock Company of Philadelphia, Pa., is a new firm which has been organized by William A. Coll and L. Jack Martin to conduct a business in the packing of paper mill supplies of every description specializing in the higher grades of waste paper. The office and warehouse is located at 121 South Water Street, Philadelphia, where this concern is nicely equipped to handle all grades of material.

* * *

The State of Maine now has what is believed to be the only paper mill in the United States making the India paper which has of late been found useful in printing large encyclopaedias, as it is a paper very fine in texture, very thin, very light and very strong. This paper has been made in England heretofore. The Warren Paper Company has recently installed a machine to manufacture this paper at its mill in Gardiner, Me., and the process has proved a success. The installation of this and additional similar machines may mean the revival of the growing of flax in large quantities in Maine, as the paper is made from flax fibres.

* * *

New England paper manufacturers recently complained before the Interstate Commerce Commission over the existing rates on printing paper, other than news print paper, from points in New England to points in the territory of the Central Freight Association. The claim was made that the high rates charged were injuring the business. It was stated that in June, 1913, the Boston & Maine and other railroads advanced these rates 20 cents a ton, which action, as stated, made the paper rates much more reasonable. The complaint was signed by the New England Paper & Pulp Traffic Association of Boston.

* * *

A deal was closed during the past week whereby the Keyes interests are again in ownership of the Nashua River Paper Company at Pepperell, Mass. Charles H. Clinton, who with the Hamtermill Paper Company of Erie, Pa., purchased this plant from Messrs. Keyes about four years ago and conducted it since as the Nashua River Paper Corporation, recently purchased the interests of the Hamtermill Paper Company in the business and organized the Babbatasett Paper Company with the idea of continuing the business under that name. Since this latter corporation was formed, Mr. Clinton sold his interests to Messrs. Keyes, who were large holders of bonds of the Nashua River Paper Corporation, and the concern in future will be known as the Nashua River Paper Company, its original title.

The executive committee of the wrapping paper division of the American Paper & Pulp Association met in the association's rooms at 50 Church street, New York, April 20. Since the adoption of the amended by-laws by the executive council of the parent body allowing the various divisions to elect their own secretaries, the wrapping division has been active in reorganizing and looking out for a man to take care of its statistics. At this session the committee decided upon H. H. Bishop, of Cleveland, Ohio, as the secretary of the wrapping division. Mr. Bishop is a man who has had a great deal of experience as a statistician, and has been identified with association work of the character most desired by this committee. Mr. Bishop's work, however, has been outside the paper industry. The executive committee comprises Frank L. Moore, president of the Newton Falls Paper Company, of Watertown, N. Y., chairman; M. E. Marcuse, of the Bedford Pulp and Paper Company of Richmond, Va.; Allen M. Fletcher, of the Fletcher Paper Company, Alpena, Mich.; George E. Grafts, treasurer of the Orono Paper Company, Orono, Me., and George C. Bayless, of Bayless Manufacturing Corporation of Autin, Pa.

* * *

A contract has just been closed with the Berlin Mills Paper Company of Portland, Me., and Berlin, N. H., with the Connecticut Valley Lumber Company, by which the paper company acquires all the soft wood timber in a tract of 45,000 acres on the Androscoggin slope. There are in it about 500,000,000 feet of soft wood, and this is practically virgin territory. The Connecticut Valley Lumber Company has confined its operations to the Connecticut slope, where it owns approximately 260,000 acres, with a soft wood stumpage of about 1,500,000,000 feet. The contract covers continuous cutting over a considerable term of years at a rate that puts the transaction in the front rank of negotiations in timber and pulp wood. The price at which the sale was made has not been given out, but it is understood to be on a basis commensurate with the present valuations of timber and its rate of enhancement. The Berlin Mills Company expect to use the entire yield in their extensive mills at Berlin, N. H.

* * *

George H. Hinman, former publisher of the *Inter-Ocean*, of Chicago, Ill., now in the hands of a receiver, has reached an agreement with the Lake Superior Paper Company as to the \$600,000 first mortgage bonds outstanding. Attorney Levy Mayer announces that his client, the Lake Superior Company, would no longer contest the validity of the bonds. Attorney John S. Miller argued in behalf of the Adsit estate for a claim for rent of \$112,000. Mr. Mayer began his answer. He said the Adsit estate must look to the Columbia Amusement Company.

* * *

The Manufacturers' Paper Company, which has been located for many years at 41 Park Row, New York, last week to the Forty Second street Building, 30 East Forty Second street. In the new location the com-

pany occupies a large part of the fifth floor facing East Second street and also Madison Avenue, with the entrance at room 504.

While the reorganization plans of the Remington-Martin group of paper mills in northern New York has not been finally brought to a successful issue, it is reported that work is progressing very favorably. Signatures representing over a million dollars of the claims against the Remington interests have been given as favorable to the Lansing plan of reorganization. About \$200,000 in claims have not signed as yet and until all signatures are obtained the plan cannot go through. It is stated that the outstanding claims are gradually being signed for.

The Oxford Paper Company of Rumford, Me., will start construction on a two-machine addition to the mill within the next few weeks. Engineers have just completed plans for the wing. The installation and operation of these machines will make a large increase in the output of the mill and will mean the employment of many extra men. One of the machines will be installed immediately upon the completion of the wing and the other a little later. There will also be additions to the other departments to provide for the new machines.

The Martine Cantine Company, of Saugerties, N. Y., has filed a complaint with the Interstate Commerce Commission against the et al. in which they attack the rates on surface-coated book papers from their mill to Cincinnati of 26c, as against a rate of 12c from Kalamazoo and 7c. from Hamilton. Other rates attacked are 10c. to New York, 30c. to Chicago, 35c. to St. Louis, 21c. to Cleveland, 25c. to Columbus, 15c. to Buffalo, 23c. to Detroit, 12½c. to Syracuse, 14c. to Rochester, and 18c. to Pittsburgh. It is alleged that the carload rates paid by surface coated book paper manufacturers at Kalamazoo, Mich., and Hamilton, Ohio, to Saugerties are 80 per cent. of the sixth class rate, while from Saugerties to those points the rates are straight fifth class. They ask for a cease and desist order, and the establishment of reasonable rates.

That the Curry & Whyte Company bought pulp wood from him for which he has not been paid and that measurements of forest products delivered the company were fraudulently misrepresented to him, is the complaint of Gust Anderson in a suit for \$10,124.65 filed in District Court at Duluth, Minn. Anderson says he and the company entered into an agreement November 17, 1911, by which he contracted to sell and deliver a quantity of pulp wood. He says he complied with the contract, but the Curry & Whyte Company, after getting the measurements from the mill, misrepresented them to him, causing a heavy financial loss.

The Mansfield Paper Company, of Boston, Mass., was started last week with a capital of \$300,000. The company is erecting a modern plant at Mansfield, Mass., for the purpose of manufacturing waterproof papers and specialties. The officers of the company are: Arthur D. Little, the well-known chemist President; C. E. Thomas, the chemist, Treasurer; Hurdley, Secretary; and Carl F. Wood, Secretary. Besides the company, the following directors are named: Walter A. Lawrence, the well-known pulp manufacturer, and

Philip W. Wrenn. It is expected the plant will be completed very soon and the concern will be ready to market their product by early summer.

The Doton H. Slawson Company has leased to the United States Paper Board Company for a term of years the seventh floor in the Burrell Building at 171 Madison Avenue, New York. The space will be used for executive offices of the company, who will occupy the new quarters in the very near future.

The work of enlargement still goes on at the mills of the Champion Coated Paper Company at Hamilton, Ohio. The first of the six new machine engines to be installed in Mill No. 1 has been placed on the foundation, and will be ready for operation in a short time. The new engines are similar to those used in Mill No. 2 and are to drive the machines only, the old engines being retained to drive the constant lines and the Jordans. These engines are variable speed twin engines, and will make it possible to do away with the troublesome and expensive drives, as the speed of the machines will be varied by altering the speed of the engines.

Last week a deal was closed whereby the Strong Paper Company of Menasha, Wis., secured a long lease upon the property of the Menasha Woolen Mills Company, in which will be established in the very near future a paper pail plant. Announcement was made several months ago that the Strange Paper Company would soon engage patents for which had secured. Since that time the project had evidently been dormant, but the announcement of the deal involving the Menasha Woolen Mills property, together with a statement issued by Mr. Strange, indicates the company in the very near future will have its new plant in operation. Mr. Strange declares there already is business enough in sight to keep the proposed plant running full capacity.

Francis H. Dewey, president of the Mechanics' National Bank of Worcester, Mass., has been discharged as receiver for the Farley Paper Company, of Wendell, Mass., under a decree handed down by Judge Dodge in the United States District Court on petition of the company to have its property restored to it. The Court allowed \$2,500 for fees of receiver and counsel. In dismissing the receiver the Court has extended the time to May 15 for creditors who have not proved their claims against the company. To satisfy these claims the company has deposited \$15,000 with the Court for a settlement with such creditors on a basis of 80 per cent. The approved claims amounted to \$101,000. The value of the claims against which no proof has yet been made amounts to \$4,000 and the claims in dispute and which were disallowed by the receiver amount to \$4,500. The company was petitioned into the hands of a receiver on November 18 on petition of the Mutual National Bank. The company at the time had assets of \$200,000 and liabilities of half that amount.

The old Steyer Mill, east of Broadalbin, has been purchased by Isaac Allen, of Albion, N. Y., and as soon as alterations are made will be used for the manufacture of butchers' manila paper. This plant is the only one remaining of more than a dozen that flourished in as many hamlets of the county a quarter of a century ago. Air-dried paper board is very scarce in this country and preparations are under way for

the operation this summer of the only mill that manufactures it in this section of the State located at the mouth of the Garage Creek at Palatine Church. The board is laid on the ground and dried, and this process gives it a flexibility and resiliency which, it is claimed, cannot be secured by other means.

* * *

Knowlton Brothers, Inc., manufacturers of special papers, at Watertown, N. Y., and the Harmon Paper Company, of Brownville, are among the low bidders for the contract to furnish the Government with paper to be used in making internal revenue stamps, according to the bids just opened in Washington, D. C., by Director J. E. Ralph, of the Bureau of Engraving and Printing. Sometime ago bids were called for to be opened on that date, for the contracts to furnish the bureau with two classes of stamp paper, one class being for the regular postage stamps and the other class for internal revenue stamps. Harmon Paper Company was the lowest bidder, naming a price of 4.47 cents a pound. The Champion Coated Paper Company was next with a bid of 4.48 cents a pound, and Knowlton Bros. came third with a bid of 4.57 cents a pound. The New York & Pennsylvania Paper Company bid 4.8 cents a pound and the Miami Paper Company was higher with a bid of 4.9 cents a pound.

* * *

The wrapping division of the American Paper and Pulp Association has been active in its reorganization. Since the change in the by-laws of the parent body, which allows each division to have its own secretary, the wrapping section has been active in bringing its new organization into shape. On Monday, April 20, the executive committee of the division met in the rooms of the American Paper and Pulp Association, at 50 Church street, New York, and selected H. H. Bishop, of Cleveland, Ohio, to act as secretary. Mr. Bishop will begin his work in May, and will have his office in the rooms now occupied by the Association. His connections in the past have not been in the paper industry, but were with associations. He is thoroughly familiar with Association methods and is a capable statistician and has had the experience most desired by the executive committee.

The committee which made the selection consists of Frank L. Moore, President of the Newton Falls Paper Company of Watertown, N. Y., chairman; M. E. Marcuse, Vice-president and Treasurer of the Bedford Pulp and Paper Company of Big Island, Va.; Allan M. Fletcher, President and Treasurer of the Fletcher Paper Company of Alpena, Mich.; George E. Crafts, Treasurer of the Orono Pulp and Paper Company of Orono, Me.; George C. Bayless, Chairman of the Board of Directors of the Bayless Manufacturing Corporation of Austin, Penn. This committee was dissolved by the wrapping paper division at its session during the thirty-seventh annual meeting of the American Paper and Pulp Association at the Waldorf-Astoria Hotel, New York, on February 18 and 19. The members of it were elected to serve one year and their capacity constitutes one of an advisory nature to the division.

* * *

The annual meeting of the stockholders of the International Paper Company was held at the corporate offices of the company at Corinth, N. Y., on Wednesday, April 22. Routine business was disposed of and the following directors, whose terms expired, were re-elected: F. S. Flower, F. B. Jennings, G. F. Underwood and Rudolf Pagenstecher.

ST LAWRENCE PULP & LUMBER CO.'S PLANS

The St. Lawrence Pulp & Lumber Company of Canada, whose incorporation, financed and controlled by William Whitmer & Sons, Inc., lumbermen, and Chandler & Company, Inc., and W. F. Fuqua & Company, bankers, all of Philadelphia, was recently reported in these columns, is one of the most extensive propositions of its kind ever started in Eastern Canada. The company obtained under Crown grant a tract of some 640 square miles of spruce, balsam and cedar and pulp wood, located in the counties of Gaspé and Bonaventure, Province of Quebec. Its mills will be located on Chaleur Bay (an arm of the Gulf of St. Lawrence) at the mouth of the Grand Pabos River, which of itself forms a spacious bay. Prior to the present ownership of the property, the interests affiliated with its organization had the tract cruised by Messrs. Lemieux Bros. & Company, New Orleans, La., expert timber estimators, who reported the tract superior to any they have estimated in the Province of Quebec, Nova Scotia or New Brunswick. The timber along some of the streams has never been touched.

The timber, they state, consists of spruce, balsam, cedar, white and yellow birch, and scattered white pine. Disregarding the pine and birch, they estimate the quantities of timber on the tract, log scale, Quebec rule, as follows:

Balsam	1,212,000,000 feet
Spruce	969,600,000 feet
Cedar	121,200,000 feet

Total merchantable timber, 2,302,800,000 feet
Pulp wood

4,040,000 cords

These totals the estimators consider very conservative, especially the pulp wood, which they stated to be 10 cords an acre. Practically there is an almost unlimited supply of pulp wood on this land, enough to turn out easily 60,000 to 100,000 cords a year. The property, they say, could easily support three saw mills of a capacity of 100,000 feet a day each.

The transportation facilities are specially good, as the tract is traversed by four main rivers, the Grand Pabos, the Little Pabos, the West River, and Port Daniel River. The timber is all easily accessible by water and the topography is such that logging by railroad is also very convenient.

As to shipping, the property is accorded the double facilities of railroad and ocean transportation. It is four days distant by water and two or three by rail from New York and nearer in point of time to that city than the timber fields of West Virginia.

The company will have a saw mill of 150,000 feet daily capacity; a sulphite pulp-mill of 100 tons a day, and a standard gauge railroad, connecting with the Atlantic, Quebec & Western Railroad. About 90 miles of the railroad, including terminal trackage, have been completed, and it is now in operation into the timber limits, reaching Camp No. 1. The mills and saw site are located on the northeast shore of the Grand Pabos bay and are ideally situated from an operating standpoint. The saw and pulp mills face each other on the sides of two adjoining hills. An arm of the bay runs between them and is being dredged to form a hot pond, into which the logs will be dumped, and drawn out by the two mills as required. The present equipment now on the ground consists of one 70-ton Shay locomotive, an American Locomotive Company direct drive line engine, five steel flat cars for logs, an American log loader, with steam shovel attachment, tug boat, barges, etc. Thirty additional steel log cars have been ordered.



NEW PATENTS



SURFACES OF CYLINDERS, ROLLS AND THE LIKE.

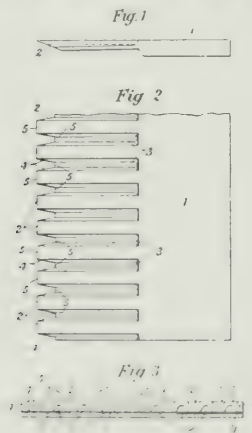
JAMES NUTTALL, Inventor.

U. S. PATENT No. 1,092,789.

This invention relates to improvements in doctors, or scrapers, for cleaning the surfaces of cylinders, rolls and the like (which I will hereinafter refer to as "cylinders") and has for its object to provide a rigid doctor, or scraper, which will have a very efficient cleaning effect, be self-sharpening and always retain a keen cutting, or scraping edge in use.

The present device may be properly used with printing cylinders or as a scraper for removing substances from cylinders of other nature, and I do not limit my invention to its use with any particular type of cylinder.

Referring to the accompanying drawing—Figure 1 is a side elevation, Fig. 2 a plan, and Fig. 3 a front



elevation of one form of doctor, or scraper, according to my invention.

According to my invention, I make the doctor, or scraper, 1, with the cutting, or scraping, edge, 2, continuous, but formed so that portions 5 thereof act upon the cylinder in different longitudinal lines parallel with the axis of the cylinder, and so that parts 4 which join the said portions also act upon the said cylinder.

My improved doctor, or scraper, 1, is made of metal, or other suitable material, and may be formed with grooves 3 between, which are at right angles, or other suitable angle, to the axis of the cylinder, these grooves being preferably larger at the top than at the bottom, or vice versa, and being formed on one, or both sides, of the doctor, or scraper, and having any desired depth and shape.

In the accompanying drawing grooves 3 are shown formed in both sides of the doctor, or scraper 1.

The edge 2 of the doctor, or scraper, thus formed being bevelled, or cut or cast, on an incline, as shown in Fig. 1, will, when pressed against the surface of the cylinder, present thereto portions 5 which act upon the cylinder in different longitudinal lines parallel with the axis of the cylinder and parts 4 which also act upon the cylinder.

The parts 4 of the edge 2 of the doctor, or scraper 1, which join the portions 5 are preferably inclined to the direction of rotation of the cylinder as shown more clearly in Fig. 2 of the accompanying drawing so as to have a shearing action, which will be increased if the doctor or scraper, be caused to have a reciprocating motion across the surface of the cylinder, parallel with its axis, the doctor, or scraper, being thus reciprocated by any suitable reversing mechanism.

I wish it to be particularly understood that I do not limit myself to the precise formations of doctor, or scraper, shown in the accompanying drawing as it is obvious that modifications in the formation can be made without departing from the spirit and scope of the invention.

The doctor or scraper may be made of any suitable metal or alloy which should be sufficiently hard to always retain a keen cutting or scraping edge when in use as the wear on the bearing surface continues.

PULP STRAINER.

Theodor Qviller, of Lillestrømmen, and Hans Stub, of Christiania, Norway, Inventors

No. 1,092,389.

This invention relates to pulp strainers of the horizontal shaft type having a cylindrical or nearly cylindrical straining body and a centrifugal drum rotating inside the straining cylinder. It consists in improved means for distributing the pulp to the blades of the centrifugal drum from a central tube.

In pulp strainers used for straining cellulose it is important that the pulp be not beaten by the blades of the centrifugal fan, because knots and pieces of wood which are only partly digested should not be disintegrated. In pulp strainers hitherto known of the type referred to knots that are only partly digested are disintegrated by the beating.

In the accompany drawing a pulp strainer embodying our invention is shown.

Figure 1 is a vertical axial section through a strainer. Fig. 2 is a development of a portion of the inlet side of the fanbody showing the manner in which the distributing channels are arranged.

The general arrangement and constructional features of a strainer of this kind being so well known, it is sufficient for explaining the drawing to state that the shaft A carries a fan having blades B which may be radially, or nearly radially, disposed or they may have

a somewhat curved shape, C designates the hub of the fan, and D a rim between which and the hub there is a curved body E. This curved body is preferably of a conical shape nearest the hub, and this concentrates a pulp feeding tube M, there being mounted in this tube an axially adjustable ring N, serving as a valve to regulate the flow of pulp into the strainer from the tube. The curved body E is provided with obliquely disposed ribs F, forming between them channels which lead the pulp from the cone to the blades, in such manner that the pulp is evenly dispersed to the blades. As the pulp is in this manner successively im-

coil up and fall from the wires. It has been found, however, that suction-strainers (those operated by or utilizing suction) are considerably more advantageous, in having a pulp-receiving capacity so much greater as to enable the pulp to be fed onto them at a degree of concentration up to 1 part of pulp to 100 parts of

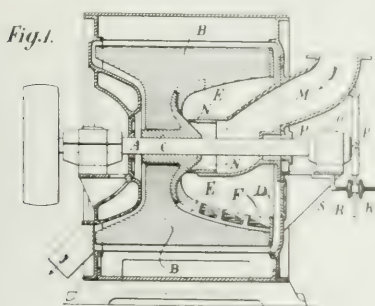
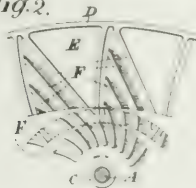


Fig. 2.



parted the rotary motion and there is no sudden change in the direction of its flow, there will be no beating action of the pulp, but the fan will smoothly take it up and press it outwardly on the straining surface in a nearly tangential direction. The adjustment of the ring valve N may be effected by a lever O, connected with the valve by means of rods P, and held in any desired position by means of the screw wheels R on the rod S.

PLANT FOR REMOVING WATER FROM PULP IN WOOD-PULP MILLS.

By Peder Christian Schaanning, of Christiania, Norway.

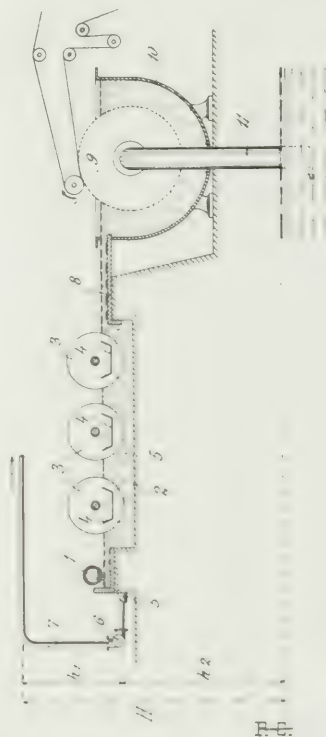
U. S. Patent No. 1,094,378.

The objects of this invention are, to speedily remove water from the pulp, and to reduce the cost of erection and of maintaining a plant of the desired character.

The pulp discharged from the grinding apparatus is diluted with water, generally in the proportions of from 1 part of pulp to 500-700 parts of water. This has been a suitable condition or degree of dilution when the pulp is to be received on ordinary strainers operating without suction. Pulp of a materially higher degree of concentration will not be satisfactorily deposited on the wires of such strainers; it will

water without coiling itself or falling from the strainer. In taking advantage of this fact, I subject the pulp to the action of water-removing means, before the pulp reaches a suction-strainer. In the present case the water-removing apparatus may comprise a series or succession of strainers which remove a substantial portion of the water, reducing the proportions from 1-600 to, for instance, 1-100, in which latter condition the pulp will then be subjected to the action of a suction-strainer, for a final water-removing operation. The resulting benefits are, considerable increase in the productivity of the suction-strainers and reduction in cost of construction and of operation and for attendance.

Referring to the accompanying drawing, 1 indicates a pipe or chute, leading from the sorting apparatus and delivering pulp, in highly-diluted condition, to a basin or reservoir, 2. A number, shown as a series or succession of water-removing strainers, 3, are shown as dipping into the diluted pulp in the basin. Cylindrical revoluble strainers are shown, and during the motion of the pulp past these strainers, each of the latter lifts large quantities of water, containing farinaceous pulp matter, and the water thus removed is caught in the clutches or troughs, 4, to be led off through a pipe, 5, to a pump, 6, destined to raise the



through a pipe, 7, preferably for re-use in dilution of pulp. The removal of water from the pulp is accomplished by means of strainers, 3, gradually concentrates the pulp, so that, at the discharge end, 8, of the basin, the pulp may have reached a dilution of, say, 1 part pulp to 100 parts of water. In this concentrated condition, the pulp is fed or led into a receptacle, 10, for a suction-strainer, 9. The pulp freed from such farinaceous matter and water, quickly passes as a coat on the wire of the suction-strainer, to hold back farinaceous matter from a discharge pipe, 11. As a result, substantially pure water is discharged from the apparatus into a river or other point.

It is to be noted that the illustrated form of apparatus requires pumping of separated water only the distance represented by h_1 , not the entire height represented by H —thus saving the power otherwise called for to raise the water the distance (from 3 to 5 meters) represented by H .

As an example of the comparative economy resulting from a plant made according to my invention, it is pointed out that a grinding mill employing ten ordinary strainers (known as "Gaara strainers"), with a productiveness of six tons, for removing water, requires five attendants per working period—or ten workmen in each twenty-four hours—while a plant of like capacity with the substitution of suction-strainers reduces the number of these to two for each working-period, or four for each twenty-four hours. In the first case, it is difficult for an attendant to manage more than two machines, requiring him to constantly walk to and fro to attend to them alternately, while in the second case, water-removing strainers require no attendance, and one workman cares for two suction-strainers. Additional economies are attained with respect to space and first cost, two pulp-making machines being required as against ten of the older kind, six water-removing strainers, in a common wooden box, and two suction-strainers, occupying less space and being considerably cheaper to construct and maintain than ten ordinary strainers in separate boxes. It is also obvious that the consumption of fittings (for instance, the consumption of felt) will be highly reduced. Another advantage resulting from this invention, in rebuilding old grinding mills, is that old strainers can be employed as water-removing strainers, reducing the rebuilding expenses much lower than if a large number of exclusively suction-strainers were required.

SULPHITE MANUFACTURE.

Various attempts have been made to utilise economically the substances contained in the waste liquor obtained by boiling sulphite cellulose. In boiling sulphite cellulose, more than half the weight of the wood is dissolved and carried away together with the lime and besides large quantities of lime and sulphur are also wasted. From such waste sulphite liquor a quantity of substances have been produced. As far as can be ascertained all attempts to recover economically and extensively the constituents of the waste liquor have been unsuccessful, owing to the high degree of dilution of the waste liquor. It has only been possible to recover the fermentable kinds of sugar containing in the waste liquor for producing alcohol. The small quantities of substances organic as well as inorganic, dissolved in the waste liquor has always been considered as a hindrance to the economical utilisation of the waste liquor in the manufacture of pulp.

An invention, patented in the United Kingdom, by Mr. Evik Oman, of Stockholm, consists in using the waste liquor instead of fresh water for preparing fresh boiling acid by adding lime or magnesia or alkali and sulphur dioxide to the liquor, the boiling liquor thus obtained being used for another boiling of splinters. Of course, the waste liquor obtained in this manner contains about twice the amount of dissolved substances as the common waste liquor. The waste liquor thus obtained may be used anew for preparing fresh boiling acid, and by boiling with this acid a waste liquor is obtained of a concentration about three times as great as that of common waste liquor, etc. In this manner a waste liquor may be obtained, without difficulty, being three to four times as concentrated as the common waste liquor, the incrustations being nevertheless extracted from the wood in a satisfactory manner.

The invention may be carried out in various manners. The following process is, however, to be preferred. When the waste liquor, by the use of old liquor for preparing fresh boiling acid, has attained the desired concentration, part of the said liquor is used for recovering the organic or inorganic substances contained therein, and the remainder of the waste liquor is used for preparing fresh boiling acid by adding further quantities of lime or magnesia or alkali together with sulphur dioxide. Besides waste liquor, a suitable quantity of the washing-water may preferably be used, said water being obtained by washing the pulp, or a suitable dilution of the concentrated liquor before using it for another boiling process. At the beginning of the process, before the waste liquor has attained the desired concentration, such a dilution is, of course, unnecessary.

The advantages of the present invention are firstly that a waste liquor of such concentration is obtained that an economical utilisation thereof will be possible, and secondly that the quantity of the pulp obtained will be greater, and finally has the corroding influence of the boiling liquor on the boilers and the conduits, etc., will be less than otherwise.

From the comparatively concentrated waste liquor obtained in this manner, the dissolved substances may be recovered either by first transforming the fermentable substances into alcohol and distilling the same, the remainder of the dissolved substances being then recovered by precipitation or concentration, or by first removing, wholly or partly, the dissolved non-fermentable substances into alcohol which is afterwards distilled.

The present process is especially adapted for the manufacture of strong pulp or half-cellulose, because the extraction of the incrustations from the wood may in this process be regulated more easily than in the usual boiling of sulphite cellulose. In the latter process the acid affects, at the beginning of the boiling, the fibres of the cellulose as well as the incrustations, which involves a loss of cellulose, and moreover, a part of the splinters will be dissolved completely, which is not to be desired. In this manner there are obtained incrustations to such an extent that they are capable of on the one hand fibres of cellulose totally freed from being defibrated. A pulp of this kind is not, however, homogeneous and, on account thereof, of less value. In using the present process the said disadvantages are obviated because the cellulose is not affected at the beginning of the boiling process, and besides it will be possible, by suitably adjusting the quantity of lime or magnesia or alkali relative to the quantity of wood, to control completely the degree of boiling, the pulp, moreover, being practically homogeneous.

PULP AND PAPER NEWS

The Parsons Pulp & Lumber Company are installing 27 induction motors throughout the different departments of their pulp mill at Chandler, Que. These motors are being supplied by the Canadian Crocker-Wheeler Company. Our item in reference to this plant which appeared in the April 15 issue would make it appear that this equipment was supplied by another company.

Driftwood Lands & Timber, Ltd., has taken out an Ontario charter. The powers are very extensive among which are the right to carry on in all its branches a lumber, timber and pulpwood business, and to manufacture, produce, buy, sell and deal in timber, logs, lumber and wood of all kinds. The capital of the company, whose headquarters is in Toronto, is \$150,000.

The British American Wax Paper Company, of Toronto, Canada, of which H. B. Hart, is manager, has increased its facilities by fifty per cent by taking in a large portion of another floor in the Darling Building. Three machines for waxing paper are kept constantly in operation.

Mr. C. C. Mendham who has been connected with the outdoor staff in Toronto of the Herbert Morris Crane Hoist Company, Limited, has now been appointed Resident Engineer in Berlin for the same Company. This appointment is in line with the well-known policy of the Herbert Morris Crane & Hoist Company which consists not only in carrying stocks of their manufactures to ensure prompt delivery, but in furnishing also a Consulting Engineering Service, which will advise on the best equipment for any given set of conditions.

The Journal of Commerce Publishing Company, Limited, of Montreal, has been recently incorporated with a capital of \$500,000. This company will publish the "Daily Journal of Commerce" devoted exclusively to Commerce and Finance under the Editor-in-Chiefship of the Hon W. S. Fielding.

We are glad to note that Mr. Arthur P. Tippet, head of the firm of that name in Montreal, is rapidly recovering from his recent severe illness. Mr. Tippet is now able to be around, and expects to get back at work in a short time. His many friends in the industry will be glad to hear this good news.

W. D. Gregor, mill manager for Price Bros. & Co. Ltd., at Kenogami, Que., has resigned, and will leave Kenogami shortly. The wood room of the Kenogami mill has been completely re-arranged, and other extensive alterations carried out.

Extensive improvements and alterations are being made to the plant of the Jonquiere Pulp Co.

Alex. Annandale, who has been temporarily engaged with Price Bros., at Kenogami, on efficiency work, has completed his work there.

C. F. Beyerl, who recently resigned as secretary of the Hammervill Paper Co., of Erie, Pa., was in Toronto and Montreal lately looking over the situation here. We understand that Mr. Beyerl contemplates enter-

ing the Canadian field as a manufacturer of writings and bond papers.

The Toronto Paper Manufacturing Co., whose mill at Cornwall has been closed down while new retaining walls were built at Locks 19 and 20 on the Cornwall Canal, resumed operations last week, the plant being given a thorough overhauling.

The lumbermen of Toronto have taken steps to form a club and secure permanent quarters. Committees have been formed and it is expected that definite arrangements will be concluded in a few weeks.

P. L. Colbert, one of the city salesmen of the St. Lawrence Paper Mills, Toronto, has been removed to London, Ont., where he will have his headquarters. He is a brother of E. R. Colbert, Managing Director of Gummied Papers, Limited, Brampton.

The Workmen's Compensation Act, which has been before the Ontario Legislature for some time has passed its second reading with some few amendments and it is expected that the measure will soon become law.

John A. McAndrews of Toronto, has issued a writ against F. H. Anson and Shirley Ogilvie of Montreal, for account of profits due under an agreement of commission on sale of stock in the Abitibi Pulp and Paper Co. and interest on certain amounts.

Extensive improvements are being made to the building of the Riordon Pulp and Paper Co. at Merriton, Ont. New cement floors are being laid, the roof on the former paper mill portion of the plant is being renewed and the four digesters relined.

Figures have been compiled showing that the united port of Port Arthur-Fort William leads the Dominion in tonnage values and is the fourth on the American continent. The head of the Great Lakes is sixty million dollars ahead of Montreal, her nearest Canadian rival. In the receipts and shipments last year there were 162,000 tons of lumber and pulp wood valued at \$840,000.

The Department of Lands, Forest and Mines of the Province of Ontario has declined to supply any of the Opposition members in the Legislature with confidential information in regard to the timber found on the townships of Thistle and McWilliams, the two townships sold last year to lumbering companies, or eight timber berths in all. In the Public Accounts Committee recently, with Deputy Minister Aubrey White on the stand, an effort was made to find out what estimates the department had received on the timber before selling the berths. Mr. White refused to answer on the ground that the Government considered the information confidential and that it would be unfair to the purchasers to make known the figures. Hon. Mr. Hearst upheld Mr. White in the position that he took, and declared that the Government had got a good price. The exposed condition of the timber under discussion and the damage to it from fire had been one of the reasons for making the sale. The Minister pointed out that the timber in the berths was defective and that it was proving even worse than it was thought to be. He contended that the Government had made a good bargain.

Eighty thousand acres of land adjacent to the Grand Trunk, presently bordering on the railway, will be opened to the public in the valley of the south fork of the Fraser River in June, according to the announcement recently made by Hon. Wm. R. Ross, Minister of Lands in British Columbia. When the work of building the Grand Trunk Pacific Railway was begun, the valley, which contains a large amount of agricultural and wooded lands was placed in reserve. The main industry of a great part of the valley, other than farming, will be lumbering, and this should reach considerable proportions. There is a large amount of good timber. A large mill with maximum daily capacity of 100,000 feet has been built by the Upper Fraser River Mills Company near Dome Creek.

Herman Henry Cook, well known as a wealthy lumberman and formerly a member of Parliament, died at his home in Toronto on Monday, April 13. He was born in 1837 in Dundas county and entered the lumber business in 1858 when he secured extensive limits in the Georgian Bay region and built one of the largest sawmills in the Dominion at Midland City. Later he became president of the Ontario Lumber Company.

The Dominion Pulp Co. at Chatham, N.B., have reopened after entirely rebuilding their plant. All the useful machinery of the old Miramichi Sulphite Fibre Co. was used, and a new Pusey & Jones drying machine installed. A new Barker acid system was also installed.

The Maple Leaf Lumber Co. has been granted a charter. The head offices are in Toronto and the capital stock is \$40,000. Among the powers of the company are those of developing lumbering, mining and farming properties. Other charters which have been issued recently are to the Industrial Publishing Co., with a capital of \$150,000, and headquarters in Toronto, to carry on the business of printers, engravers and publishers, the incorporators being P. E. Hambly and F. P. Hambly, W. E. Hunter, A. K. Goodman, and Lionel Brayley, all of Toronto; and the Multipress Company, also of Toronto, with a capital of \$60,000.

A large number of experienced rangers have been engaged by the Ontario government for fire protection duty during the coming summer, and have commenced their work. Students are practically cut off this year from the service as fire rangers owing to the rigid regulations, which have gone into force. The Department of Lands, Forests and Mines decided that no student should be taken on who was not available by May 1st. This has shut out all the arts and medical boys of the University of Toronto, many of whom for years past have found steady employment for several months in the bush. Only a few students in Science have been able to get away in time and this year a relatively small number of applications were received from the young men at the University.

A large deputation waited upon the Ontario Government last week representing the Timiskaming, Sudbury and Nipissing districts to urge the immediate extension of the Elk Lake branch of the Timiskaming and Southern Ontario Railway to Gowganda. Provision has been made in the estimates for this extension and now that a satisfactory location has been found, it is likely that the work will be proceeded with at once. It is expected that the connection will be secured between the two lines.

The Victoria Paper and Twine Co. have completed the removal of their large store to the Victoria building at 439-441 Wellington Street West, Toronto. Manager Charles V. Syrett and staff are now comfortably installed in the offices on the first floor, which are finished in oak in attractive style, with departments for salesmen, sample rooms, accounting, etc. The manufacturing department of the company, The Victoria Paper Goods Co., will also be installed in the new building later on. The structure represents the last word in stock piling advantages, space economies and shipping facilities.

The Jonquiere Pulp Co. have shut down their sulphite mill entirely. They are taking their supply of sulphite from the Kenogami Mills of Price Bros., one and a half miles distant. The new sulphite mill at Kenogami is larger than the requirements of the two mills, hence Price Bros. intend putting on the market about 10 tons of pressed sulphite pulp.

The Belgo-Canadian Company is installing a fourth machine, which is 202 inches wide and will increase its news output to 170 tons per day. Its new 60-ton sulphite plant, which is nearing completion, will be in operation early this summer. A new Barker tank and tower system for acid making is being installed.

The premises of the Alberta Lumber Co., Vancouver, B.C., were damaged by fire to the extent of half a million dollars on April 18. The yards contained a very large quantity of lumber at the time.

EUROPEAN NOTES

(Specially translated from late numbers of foreign Trade Papers).

BAMBOO FOR PAPER MANUFACTURING

According to a report received from Taipeh, Formosa, the local paper mill, where bamboo was used instead of wood pulp, has been found to be a complete failure.

Although ample and sufficient capital was provided, the company decided to shut down the mill since the manufacturing of paper from bamboo, on account of entirely too heavy losses, proved to be a hopeless task. Most of the help secured from Japan has been sent back to their native country, and but a few remained to continue with work of an experimental nature. It was claimed that the high costs for manufacturing paper from bamboo caused the mill to be a financial loss.

While a detailed report of the Taipeh plant and its process would no doubt be of interest, this single case of a failure in making paper from bamboo cannot be looked upon as a criterion.

NEWS

Sweden and Norway are affected by the generally prevailing business depression in British paper mills. The demand for chemical and ground wood pulp in British mills is somewhat slack and not up to the brisk point usually experienced at this time of the year.

Norway's exports of ground wood and chemical pulp were as follows:

	Ground Wood.		Chemical Pulp	
	dry tons.	wet tons.	dry tons.	wet tons.
Jan. Nov.				
1913	16,535	452,651	191,848	2,403
1912	19,480	455,426	197,246	1,296
1911	18,098	400,763	175,204	2,898

The Swedish exports during the time from January to December were as follows:

Jan.-Dec.	Ground Wood.		Chemical Pulp.	
	dry tons.	wet tons.	dry tons.	wet tons.
1913	17,437	488,131	212,252	2,465
1912	22,285	504,409	220,060	1,337
1911	19,677	436,463	197,600	2,898

Finland's paper industry is still working under rather favorable conditions. The figures for exports in paper goods continue to increase. A decrease in exports of pulp is due to the fact that in 1913 several ground wood mills entered the box board field.

Austria-Hungary is as yet laboring under a general depression, and the outlook for the near future is not very bright. The prevailing overproduction caused an increase in exports, however, on account of the very keen competition on the foreign markets prices are rather low. The Austrian-Hungarian Paper Manufacturers Syndicate succeeded in obtaining special rates from the railroads and steamship companies.

In Germany the paper industry is fairly busy. Prices for pulp wood are still firm, while paper, generally speaking, sells at a small profit.

WOOD BLOCK FLOORS

When heavy materials like pulp wood, wood fuel, wood refuse, planks, castings and similar articles are thrown or dumped on floors you will soon find that concrete floors wear away very quickly, often get smashed up and disappear piece by piece.

Ordinary wooden floors also stand only for a few years.

Here, a floor that can stand wear and tear and is not too expensive in first cost and upkeep is most essential.

Wooden blocks, 6 to 9 ins. long and say 3 x 9 or 4 x 8 ins., of a tough wood make a good floor.

An ordinary concrete floor is laid, but not necessarily smoothed.

Well dried wooden blocks are soaked in hot creosote or wood tar, and placed in rows on and on the well dried concrete floor. Care should be taken that the blocks are well fitted together, that the rows are laid in line, like in brick work, and overlap each other, and also that every row is well filled and the last block well fitted and pressed down.

In dry places, or in cases where the blocks are not well dried, a coat of tar should be given a few months after the floor is laid, in order to fill in the spaces between the blocks and prevent them from getting loose and coming out.

A coat of tar immediately after the floor is laid is desirable, but not necessary.

In case where decoville railroads are used to convey materials to and from the different departments, old tramway rails are laid down on the concrete floor and the height of the wood blocks made the same as the height of the rail from concrete floor to rail top. This makes a floor on which decoville cars as well as trucks can be run.

Most saw mills get in their operation planks, which are not fit to be sold as such, but which can be cut up into sound wood blocks of accurate dimensions.

Those saw mills will undoubtedly be only too pleased to cut up otherwise waste material into floor blocks and sell them at a reasonable price.

NOTES ON ESPARTO GRASS

The Journal of the Society of Chemical Industry:—The Esparto plant grows best on mixed limestone and gravel soils; its natural region lies between 32° and 41° N. latitude, but it is capable of resisting considerable variations in temperature and is found at altitudes up to 3,000 ft. The last ranges in length from 30 to 70 cm., attaining 1 m. under exceptional circumstances. It is pale green when growing but becomes yellow on drying; it rolls up under the influence of dryness, attaining its cylindrical form at the ripening stage.

About 200,000 tons of the grass are imported almost exclusively by England; the quantity has remained stationary for fifteen years, a decline from one source being made up by increased importations from other sources. If the leaf is harvested before maturity the quality of the fibre is very inferior, yielding a semi-transparent paper. In most districts the use of the knife is forbidden; a tuft of grass requires 8 to 15 years before it becomes productive, and may then be "pulled" annually for 30 to 50 years. The best time for pulling is the autumn; in most countries a close season is fixed by regulation during the earlier months of the year.

The harvested grass is stored and dried for a considerable time before packing for shipment, the hydraulic pressed bales weigh about 22½ lbs per cub. ft.

The majority of German papermakers are not interested in the grass; partly through unfamiliarity, partly owing to difficulties in procuring freights. Freights from Algiers and Oran run about 28s. per ton for Hamburg and 24s. for English ports.

The area under esparto in Algeria is about 2,800,000 acres, of which about three-fourths are in the department of Oran. Regulations as to season of cropping are in force, also certain zones are reserved as a protection against sand troubles.

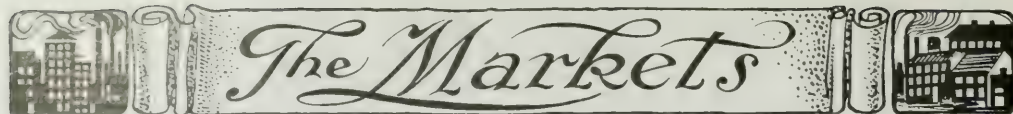
Exports from Algeria were 100,788 tons in 1911 and 116,632 tons in 1912, average price 52s. per ton; exports from Tunisia were 50,797 tons in 1911, average price 57s. per ton. Increases from these countries in recent years have taken place at the expense of the Tripoli trade, now practically ruined by war and scarcity of labor.

The Spanish variety of esparto is still the most valuable, although high prices and careless industrial habits have led to wasteful methods of cropping. Exports have declined from about 60,000 tons in 1897 to 41,000 tons in 1912, but the fluctuations since 1904 show a fairly steady average; the price runs about 95s. per ton and has fallen from more than double this figure since 1883.—Tropenpflanzer.

BIG TIMBER DEAL

The Chicoutimi Pulp Co. has just purchased from the Atlantic, Quebec and Western Railway 400,000 acres of freehold pulp wood lands, which was formerly given to the railway for the construction of 100 miles of railway line, extending from New Carlisle to the Gaspé Basin. This great area is located along the branches of the Upper Peribonka River.

The total area of freehold pulp wood lands now possessed by the Chicoutimi Pulp Co. amounts to 51,000 acres in their perpetual right, besides 450,000 acres of leasehold lands.



Canadian Markets

The conditions in the news situation remain fair, and, in the general quiet tone of the trade, print paper plants are standing the strain best. The war between United States and Mexico will, of course, add materially to the demand for news print as many papers already report a large increase in circulation. There is nothing that causes newspaper readers to multiply in all parts of the country so rapidly as hostilities between nations. Book and writing plants are marking time for the most part; printers are quiet with a few exceptions, and, when publishing houses are not rushed the sale of many kinds of paper suffers. The wrapping paper situation is very dull and it is said that mills are accepting orders at very low prices from jobbers in order to keep the machines running. Users of wrappings of all kinds are buying in limited quantities and are taking every precaution to see that they do not get stocked up. There have been some heavy sales of Kraft on the Toronto market during the past few days at \$2.60 and \$2.75 in order to clear out certain surplus products. The consignment was quickly snapped up. Ground market conditions remain unchanged and there is very little business, most of the shipments being made on contract. Prices remain at \$21 to \$23 delivered, according to freight rates and destination. The demand for sulphite pulp continues fair, and there are no large stocks on hand in Canada. As the weather gets more seasonable the demand is better. In some of the Western States the mills are already suffering from low water. Prices for unbleached sulphite remain at \$42 to \$44 delivered, and for bleached the quotations run from \$55 to \$58 delivered. The rag and paper stock market is dull and mills are not purchasing in any large quantities. The outlook is fair but in all lines of paper and pulp the present summer will it is thought, not be nearly as active as last summer. While orders are numerous in certain lines they are small and it is quantity orders which count and keep mills going remuneratively. When the runs have to be changed frequently and different weights and widths and colors made it is much more difficult to operate the plants profitably six days and nights in the week.

Quotations f. o. b. Toronto:

News, rolls \$1.95 to \$2.00 at mill in ear load lots.
News, sheet \$2.10 to \$2.20, at mill in earload lots.
News, sheet \$2.25 to \$2.50, depending on quantity.
Book papers (earload) No. 3, 3.75c to 4.25c.
Book papers (ton lots) No. 3, 4c to 4.50c.
Book paper (earload) No. 2, 4.25c.
Book papers (ton lots) No. 2, 4.50c to 5.25c.
Book papers (earload) No. 1, 4.50c to 5.25c.
Book papers (ton lots) No. 1, 5.25c to 6.00c.
Wrappings, 5c to 7 1/2c.
Sulphite Bond, 6 1/2c to 7 1/2c.
Mott Brown, \$2.10 to \$2.15.
Grey, 2 1/2c to \$2.30.
Manilla B. \$2.25 to \$2.35.
Manilla, 2 1/2c to \$2.75 to \$2.80.
Manilla, 2 1/2c to \$2.85 to \$2.90.

Un glazed Kraft, \$3.75 to \$4.50.

Glazed Kraft, \$3.90 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$15.50.

Ground Wood, \$21 to \$23, delivered in United States.

Sulphite (unbleached), \$41 to \$43, delivered in Canada.

Sulphite (unbleached), \$42 to \$44, delivered in United States.

Sulphite (bleached), \$55 to \$57, delivered in Canada.

Sulphite (bleached), \$56 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87 1/2 to \$1.90, f.o.b., Toronto.

No. 1 soft white shavings, \$1.75.

No. 1 mixed shavings, 50c.

White blanks, 92 1/2c to 95c.

No. 1 Book, 5 1/2c to 6c per lb.

No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; to \$50 per ton for small orders.

Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.

Heavy ledger stock, \$1.40 to \$1.50.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$47 to \$50 in small quantities.

No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities;

Ordinary ledger stock, \$1.15 to \$1.20.

No. 2 book stock, 45c to 50c.

No. 1 book stock, 75c.

No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.

No. 1 print Manillas, 60c.

Folded news, 45c to 50c.

Over issues, 50c to 52 1/2c.

No. 1, Clean mixed paper, 25-30.

Old white cotton, \$2.50 to \$2.75.

Thirds and blues, \$1.30 to \$1.32 1/2.

No. 1 white shirt cuttings, \$5.00 to \$5.25.

Blue overall cuttings, \$3.50 to \$3.60.

Black overall cuttings, \$1.75.

Black linings, \$1.75.

New light flamelettes, \$4.75.

Ordinary satinets, 75c to 80c.

Flock, 90c.

Tailor Rags, 70c to 75c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.

Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.

No. 1 Book, 5 1/2c to 6c per lb.

No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.

No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.

Wrappings, 5c to 7 1/2c.

Sulphite Bond, 6 1/2c to 8 1/2c.

Wrappings.

Grey Brown, per 100 lbs., ear lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.35; 1 ton, \$2.65; less, \$2.75.

Red Brown, ear lots, \$2.85; 5 tons, \$2.95; 2 tons,

\$3.05; 1 ton, \$3.15; less \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground woods, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

New York Markets

Special to Pulp and Paper Magazine).

New York, April 25, 1914.

There has been no change in the general condition of the chemical pulp market. Advices from Scandinavia show that there is a plentiful supply of sulphite for export. The present low quotations just about meet the cost of production, and if prices go any lower serious difficulties at the pulp mills are likely to follow. Bleached sulphite is moving normally on contract lines, but new orders are few and slow to mature. Unbleached sulphite is quiet, but importers are holding out for the market price. Paper mills are delaying in their contract arrangements for a lower price. This is hardly probable, as there is no profit for the pulp makers even at present. The condition of bleached sulphite is such that a short time contract can be closed at a lower figure than one for a long period. Sulphite and soda have been quiet during the interval, activity being confined to shipments for consumption in contract channels. The spot market for Kraft pulp has been fairly strong and a short supply on this side is reported. In the interval a few good-sized contracts were closed, but the spot market reflected a quiet time.

A number of grinders have contracted for non-mechanically ground wood pulp than their plants can produce during the year. This was done in anticipation of some losses during the summer months when some mills may request that shipments be suspended. At present heavy shipments are being made on contract orders due to the heavy consumption of newsprint paper. Plentiful supplies of water have greatly enabled manufacturers in the grinding of large quantities of timber. The price is unchanged at present, no contracts being closed in the local market under \$16.50 a ton at the mill for Number 1. There is a hopeful feeling here that the year will be good for ground wood.

The rag stock market has been fairly active along contract lines. The greatest volume of business has been in the lower grades. Roofing stock has been in fairly good demand and values are firm with an up-

ward tendency. Bagging in all grades has reflected a quiet tone and there has been a softening in the price of old gunny. Advices from Calcutta show a shortening of the raw material for jute twines, which are high in price and are likely to go still higher.

The old waste paper market has been fairly active in the interval and large shipments on contract have been made to mills using all grades. Soft and hard white shavings continue to hold firm values and the difficulty is to get stock to supply the fairly strong demand. A good demand for overissure news has been felt among the local trade and prices are well maintained. Strictly folded news has been in active inquiry at prevailing quotations. Mixed papers are fairly active, but prices are not likely to tower to the heights of a year ago:

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.,
 Ground Wood, No. 2, \$15 to \$17, delivered.
 Unbleached sulphite, dom., 1.90c to 2.20c delivered.
 Unbleached sulphite, impt., 1.3c. to 2c. ex dock, New York.
 Bleached sulphite, domestic, 2.80c. to 3c delivered.
 Bleached sulphite, impt., 2.70c. to 2.95c., ex dock, New York.
 Easy Bleaching, impt. 2.05c to 2.20c ex dock, N.Y.
 Unbleached sulphite, impt., 1.80c. to 2.10c., ex dock, New York.
 Bleached sulphite, impt., 2.60c. to 2.80c., ex dock, New York.
 Kraft pulp, impt., 1.80c. to 1.95c., ex dock, N.Y.
 Soda pulp, dom., 2.15c. to 2.1c., delivered.

Paper

General business conditions in this vicinity are only fair. Banks have large accommodations of money which is found difficult to loan. The rate for call money is lower than it has been for some time. Collections on outstanding accounts have been fairly good. The general tone of the paper market is one of hand to mouth buying. While mills are running fairly full, the volume of orders is not large enough to warrant investment in plants to any extent. The latter part of the interval reflected an atmosphere of extreme indifference due to the Mexican situation. Numerous extra editions and larger distribution of regular editions of local newspapers have done much to cut down the surplus tonnage of newsprint paper. High water has caused certain mills to shut down. Difficulty was met, in some instances, in making deliveries. There is no change as yet in the price of newspaper, but a rise must necessarily result from the present strong demand. How much the value will increase is guesswork, but that it will increase is admitted by all. The transient business has been much more active than for some time. Manila and fibre papers have been rather quiet, but there is at least a state of hand to mouth buying all the time. The demand for book paper is increasing and values reflect an upward tendency which will materialize into an increase in the near future. Coated book has shown some improvement in the local market. Tissues have been fairly active in all grades, but the price is still very low and the feeling is that few mills are realizing any but small profits. Kraft papers are still low in price and the demand for them is rather quiet. Paper specialties such as cover papers are in brisk movement and the last month has shown more business than for the same

the last year. Every month has shown fairly good gains in the specialty market over the corresponding period last year and values are firm. Writings, bonds and folios are fairly active, especially the medium grades and values are firm in all grades. Paper bags are in good demand, but there is no price cutting on the low lists. Paper towels and toilet papers are in good demand at prevailing prices. Cigarette papers still reflect an active tone with firm values. A number of foreign mills have advanced the price of newsboard to \$41 a ton, and it is likely that more will come up to the same price.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
News, sheet runs, \$2 to \$2.10 f.o.b. mill.
News, sheet, \$2.25 to \$2.30 f.o.b. mill.

Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.

Writing paper superfine, 13½c to 17c, del. east of Miss. River.

Writing paper, extra fine, 11c, del. east of the Miss. River.

Writing paper, No. 1, fine, 9c, del. east of the Miss. River.

Writing paper, No. 2, fine, 8c, del. east of the Miss. River.

Writing paper, engine sized, 4½c to 8c, del. east of the Miss. River.

Bond paper, 5c to 24c, delivered east of Mississippi River.

Ledger paper, 8c to 30c, delivered east of Mississippi River.

Linen paper, 7c to 18c, delivered east of Mississippi River.

Manila jute, 43½c to 51½c, delivered.

Manila, wood, \$2.40 to \$3.00, delivered.

Kraft, No. 1, \$3.50 to \$3.75 f.o.b. mill.

Kraft, No. 2, \$3.25 to \$3.50, f.o.b. mill.

Boxboards, news, \$30 to \$33 per ton, delivered.

Boxboards, chip, \$28 to \$31 per ton, delivered.

Boxboards, straw, \$28 to \$31 per ton, delivered.

Wood pulp board, \$42.50 to \$45 per ton, delivered.

Tissue, white, cylinder, 40c to 42½c, delivered.

Tissue, fourdrinier, 47½c to 50c, delivered.

Tissue, jute Manila, 40c to 42½c, delivered.

Some mills are still running on short time, and it is quite evident, from what one can hear amongst the agents, that stocks all round have been accumulating to an enormous extent. That, of course, means that some time must elapse before things are levelled up to their normal condition. The Easter holidays also helped to knock business back. Manufacturers continue to be firm in their prices, and are against giving concessions if there is the slightest loophole to escape them. From Scandinavia, Germany, and Finland reports reach London that the paper industry in those countries is still in a bad way for new business.

* * *

The dullness in the paper trade caused Scandinavians during the first couple of weeks in April to become nervous, and, as a result, they let down the prices of sulphite considerably. This had a material effect on the British market, and London and Manchester importers of pulp complain that the action of the Swedish mills was quite unnecessary. From a papermakers' point of view, it is difficult at the time of writing to say what new buying the low prices will produce, but so far the market shows very little change both in sulphite and sulphate. Of course, the mills in England and Scotland are fairly well stocked with pulp, but the slight revival in the paper trade and the attraction of further low prices may turn out favorable for producers of sulphite and sulphate. Should there be any signs of paper manufacturers coming into the market, it may be taken for granted that prices will at once be stiffened.

Prices are now about as follows, c.i.f. British ports:

Bleached Sulphite	\$56.00	to	\$57.00
Easy Bleaching Sulphite (No. 1) ..	30.40	to	40.00
News or strong quality	36.00	to	37.00
Unbleached soda (No. 1)	36.00	to	39.00
" " (Strong quality) ..	36.60	to	36.90
Soda Kraft	33.00	to	36.00

* * *

Mechanical pulps are slow in moving, and prices have changed in favour of buyers. The same story comes from Scandinavia, where the state of trade is bitterly complained about. English buyers, though making enquiries about prompt parcels, are slow about entering the market. Prices are now down to what they were in December last, and are in England:

Pine 50 p.e. moist, prompt (unwrapped) \$9.00 to \$9.80

Pine, dry, prompt 19.20 | to | 19.50 |

For forward delivery add about half a dollar to above prices for wet mechanical. All prices c.i.f., British ports.

* * *

The chemical trade is not enjoying a good period owing to the want of more business in the paper and textile industries. And what is more remarkable is the large decrease in the exports for March, which show that trade is not very bright in other countries. Bleaching powder is quoted \$28 to \$30; Caustic soda, \$48 per ton for 76 and 77 per cent.; Sulphur, \$26 per ton; Salt cake, \$10.20 per ton; Ammonia alkali, \$19.20. Sizing is unchanged in prices, and rosin is quiet and cheaper.

* * *

Esparto is still dear and firm, and, from all accounts, there is no likelihood of a reduction in values in the near future. Rags of all grades, old and new, are keeping quiet, but so far prices have not been changed in any way. Rag sellers are beginning to complain of the dullness, but it is quite evident that they will soon experience a revival in trade.

British Markets

(Special to Pulp and Paper Magazine.)

London, April 21, 1914.

A slight improvement in the British paper trade is now to be reported. This change is not on export account solely, but in the consumption of the domestic supply. Some of the large printing houses in London and the provinces are busily engaged, and consequently there is a good outlet for fine printing paper, writing, and coated papers of all kinds. Newsprint and cheap grades of paper usually imported, together with packing and wrapping papers, are being purchased in large quantities, which may, in a small degree, help to reduce the stocks at mills and warehouses. The export trade of the products of the British mills is not altogether outside the fact, but it is anticipated that another few months being a similar change and so relieve the dullness and lifeless condition of business that has been the case the beginning of the year. Paper manufacturers believe that the present bad trade conditions are more temporary, and they are hoping for the best

The Rotary Strainer

In many articles published about rotary strainers exact information about the speed of rotation and the area of the strainer is lacking. No cut and dried predetermined speed or superficial area can be prescribed. Both depend solely on the kind of the whole stuff and on the magnitude of the output. When the output is increased the speed may be increased, or the strokes per minute of the cam-wheel may be increased. This has a limit, however, and frequently the erection of several strainers cannot be avoided, for if the sorting is done with too great force the danger is increased of impurities and knots being driven through the cylinder and passing into the paper.

1. In a strainer comprising a rotating and simultaneously vertically shaken cylinder and in which the pulp passes from the inside outwards the superficial area, speed, width of slots and dilution of pulp must be adapted to the quantitative and qualitative output.

2. Rotating, non-shaken cylinder, and pulp driven through by means of cam-faces from the outside towards the inside. This system is satisfactory for higher grades and therefore better than 1, because the danger of knots or non-dissaggregated parts of the pulp passing through the slots is diminished, which may occur in system 1, even when the slots are 0.5 mm wide. On the other hand, the maintenance costs of this system are somewhat greater.

3. Pump strainers, in which the pulp is sucked from the outside inwards by means of a suction pump through a slowly rotating four-sided prism of slotted plates. These require expensive maintenance and entail large loss of time for cleaning the apertures.

A suitable modification of system 2 consists in the rotating non-shaken cylinder driven slowly being made very large, the pulp likewise passing from the outside inwards. In addition, however, the strainer alone is no guarantee for a perfect paper. Scrupulous cleanliness, correct treatment of the raw pulp, etc., must relieve the sorting work as much as possible. That strainer must be considered the best which contains the largest output with the smallest attendance and consumption of power.—Der Paper Fabrikant.

QUEBEC WHARFAGE AND STORAGE CHARGES ON WOOD AND PULP.

New wharfage and storage charges have been fixed by the Quebec Harbour Commissioners in a new set of by-laws which they passed, and which were approved by the Government at Ottawa recently. It is provided that lumber, timber and wood pulp for export will be free of wharfage charges, while pulpwood will be charged at the rate of 12 1/2 cents per cord. The storage charges will be as follows: On timber, lumber, pulpwood, ties, etc., per square of twelve feet, \$1 per square per month or part of a month.

THE CANADIAN FORESTRY CONVENTION

The following letter relating to the convention of the Canadian Forestry Association, to be held in Halifax in September, has been sent out to the members of the Association:

To the Members of the Canadian Forestry Association:

It has been decided upon the invitation of the Government of Nova Scotia and the lumbermen of that Province, to hold the next Canadian Forestry Convention in Halifax, N. S. on September 1st to 4th, 1914.

This will be the first Canadian Forestry Convention ever held in Nova Scotia. The need for increased information and interest is great, and from present indications it is believed this will be one of the most useful and practical conventions yet conducted by the Association. A number of prominent administrators, foresters and forestry experts have already announced their intention of taking part.

Railway arrangements for all points in Canada to the east and west of Port Arthur are nearing completion. Favorable rates are expected, of which particulars will be furnished upon application to the secretary. These rates will be available to members of the Association attending the convention and their families. When rates are announced they must be members and must register and attend as such.

Members are asked to attend this convention both to help those who are working to improve conditions in Nova Scotia and also to promote the general forestry work of the Association. Incidentally it will enable members to see and learn much of Nova Scotia and the Maritime Provinces.

Those who purpose attending should notify the secretary as early as possible, as this will greatly assist in the work of preparation. They will also be supplied with information regarding programme, accommodation, railway arrangements, etc., as soon as available.

JAMES LAWLER, Secretary,
Canadian Forestry Association.
Jennie B. - Ottawa.

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent
PUBLIC NOTICE is hereby given that on WEDNESDAY, August 5th, 1914, at 10 o'clock A.M., the timber limits and other mentioned will be offered for sale by Auction, subject to the terms of Messrs. H. M. Price & Co., Auctioneers, 126 St. Peter St., Quebec, P. Q.

License No.	181	River St. Jean	Br. East	No. 1	...	24
181	181	River St. Jean	Br. East	No. 1	...	24
182	182	River St. Jean	Br. East	No. 2	...	24
183	183	River St. Jean	Br. East	No. 3	...	24
184	184	River St. Jean	Br. East	No. 4	...	24
185	185	River St. Jean	Br. East	No. 5	...	24
186	186	River St. Jean	Br. East	No. 6	...	24
187	187	River St. Jean	Br. East	No. 7	...	24
188	188	River St. Jean	Br. East	No. 8	...	24
189	189	River St. Jean	Br. East	No. 9	...	24
190	190	River St. Jean	Br. East	No. 10	...	24
191	191	River St. Jean	Br. East	No. 11	...	24
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REORGANIZATION OF A. P. P. A. EFFECTED

(Special to Pulp and Paper Magazine).

Since the initiative taken by the wrapping paper division of the American Paper and Pulp Association in the selection of its secretary and the organizing of a permanent system for taking care of the interests of the wrapping paper manufacturers, the time is not far off when the organization of the parent body will be made known. The names of men prominent and influential in the trade have been mentioned for the positions of secretary of the news and writing divisions and also for that of honorary president.

That the organization will live and prosper is certain. The new arrangement is regarded favorably by most factors in the trade and it is the belief of the majority of influential men that the reorganization will make the work of the Association more effective than heretofore. There has been much speculation as to the secretary of the parent body, but great care has been taken in withholding the name of any choice the executive committee may have in mind. Next issue will in all probability reveal the entire personnel of the new organization.

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Timber Concessions in the Province of Quebec

Notice is given by the Government of the Province of Quebec, that, on the 11th of August, and on the 29th of October, 1914, permits to cut timber on over 8,000 square miles of Crown Lands will be offered at public auction.

The territory to be disposed of comprises some 1,200 square miles in the basins of rivers Ottawa, Harricana and Bell, in the Abitibi region; 6,000 square miles in the Lake St. John northern region; 350 square miles in the Lake St. John East agency; 242 square miles in the Matapedia division.

On the first date above mentioned, permits will be offered at ordinary conditions on some 3,000 square miles.

The timber grants advertised for the 20th of October, comprising the basins of three large rivers in the Lake St. John region, with considerable water powers, will be subject to the obligation of manufacturing the wood into pulp or paper within the province of Quebec.

For particulars, please apply to the Department of Lands and Forests, Quebec, Canada.

ELZ. UVILLE DECHENE,

Deputy-Minister of Lands & Forests.

Quebec, 11th April, 1914.



TIMBER SALE

TENDERS will be received by the undersigned up to noon of the 6th day of July, 1914, for the right to cut the Red and White Pine timber on Berths 1 B, 1 C, and 1 D, in the Mississauga Forest Reserve tributary to the north shore of Lake Huron, each Berth containing an area of 36 square miles, more or less.

For maps and conditions of sale apply to the undersigned or the Crown Timber Agents at Thessalon, Sault Ste. Marie, Webbwood and Sudbury.

W. H. HEARST,

Minister of Lands, Forests and Mines, Toronto, April 18th, 1914.

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VOL. XII.

MONTREAL, MAY 15, 1914

No. 10

Canadian Paper in Japan

That "Japan is a most promising field for the Canadian producers of pulp and paper," is the statement made in a report to the Trade and Commerce Department this week by Mr. Gordon B. Johnson, special commissioner. The department has recently made an effort to collect information through its trade commissioners, as to the prospects for the Canadian lumber and paper trades in all parts of the world, and a report as to possibilities in Japan was received this week.

Mr. Johnson says: "Japan is a most promising field for Canadian producers of pulp and paper who have up to the present done little to supply this market. While the Japanese policy, as is customary in other countries, is to shut out foreign manufacturers, as far as possible by a high import duty, and allow the raw material or material partly manufactured, to escape free or with a comparatively low duty, nevertheless in the case of printing paper, on which the duty is many times greater than on pulp, the imports are of considerable proportions, as shown by the fact that in 1913 the total value of imports was 3,445,274 yen, or about \$1,722,500. The consumption of paper of all kinds is rapidly increasing. This is very marked in the case of printing paper, the Japanese production of which rose steadily from a value of \$2,600,000 in 1905 to \$6,231,000 in 1911. The imports of printing paper have increased in the same period, amounting in 1905 to \$943,000, and in 1911 to \$1,198,500, while in 1913 the total was \$1,722,500, as stated.

"It will thus be seen that about 27 per cent. of the paper consumed in Japan, printed and other, is imported from Great Britain, Germany, Belgium, the United States, Sweden and Norway. High grade printing paper particularly is in demand from abroad, while on the other hand qualities selling at about 5 cents per pound have about ceased to come into the

country, owing to competition offered by the mills here. News print in rolls and packed flat, is manufactured in Hokkaido, and almost entirely supplies the local demand. While production of paper in Japan is rapidly increasing, the consumption is going ahead at a still faster rate, so that increasing imports may be looked for.

"Canada supplied to this country in 1912 pulp to the value of \$9,000, and in 1913 the figures were \$177,000, a gratifying increase. Imports consist principally of easy bleaching and strong, and, in a lesser degree, bleached. Canadian pulp has not as good a reputation as the European article. With such immense areas in British Columbia covered with Douglas fir suitable for chemical pulp and of Sitka spruce, an excellent pulpwood, and with Ontario, Quebec and the Eastern provinces in possession of almost inexhaustible supplies of spruce and balsam fir, it is a matter of regret that Canada supplies so little of the great and growing demand for pulp in this country, although the figures for 1913 indicate an upward movement. It will be seen that Germany, Norway and Sweden have almost the whole of this trade. While Eastern Canada is handicapped by its great distance by water from the Orient, the opening of the Panama Canal will put Montreal in at least as favorable a condition in regard to distance as those European countries, so that not only British Columbia, but Ontario, Quebec and the East should be in a position to take a share in it. In this connection it may be noted that the statement that a Japanese steamship line is arranging a service from Japanese ports through the Panama Canal to Montreal, has been denied by the head office of the company in Japan. The Japanese Government, however, is providing a subsidy for a new route through the Panama Canal to New York, calling at Seattle.

Our Paper Trade with Great Britain

The Value of Technical Literature

Some attention has been drawn of late to the possibility of increasing the exports of paper from this country to Great Britain and various opinions have been expressed in this connection, the consensus being that this trade would be very difficult to enlarge until many conditions that at present prevail in the paper industry here are overcome. Some time ago we drew attention to the fact that British paper-makers are exporting paper to the United States and at the same time German paper-makers are placing their newspaper on the British, as well as the United States markets, at a lower price than is possible to manufacture it here. Both the British and German mills have to import their pulp, but they have so reduced manufacturing costs and so utilized the waste that it appears as though it will be some time before Canadian paper will become a factor on the British markets.

The industry in the Old Country is confined almost solely to the manufacture of paper, and on the higher grades the British manufacturers have established an enviable reputation, both as regards quality and price. So much so, in fact, that Canadian paper manufacturers have trouble in competing with the British product on the Canadian market. The big proportion of the raw material is secured from Norway and Northern Russia, where the pulp is manufactured at a minimum of costs. In fact, shipments of Norwegian sulphite pulp have been made, in somewhat large quantities, to this country during the past few years, sufficient to considerably alarm the pulp manufacturers here. Shipments of Canadian pulp to the Old Country have not been large, and those mills that have made an effort to cater to that trade have been compelled to sell their product at a much lower price than is prevailing in the markets here, being able to do this on account of the advantages possessed in the way of limits, power, shipping facilities, etc.

The paper trade between Great Britain and this country has for many years been in favor of the former. Our total exports of paper to Great Britain during the fiscal year ending March 31, 1913, amounted to \$1,796,049. During the same period our paper exports to Great Britain amounted to \$586,223, of which \$292,215 worth was of "paper, costing not more than 14 cents per pound."

There is undoubtedly a market in the Old Country for Canadian paper, but not at the prices now prevailing there. The German competition will undoubtedly meet the British paper manufacturers, but it is not thought that the present situation will exist for long. The cost of manufacturing has been reduced to a great extent in British mills and the quality of their products is high. But outside competition it not much

The series of articles now appearing in the Pulp and Paper Magazine on the "Manufacture of Sulphite Pulp" have been written with the idea of giving the younger generation of pulp and paper makers some concrete information and instruction on this important phase of the paper manufacturing industry in this country. Articles such as these are very valuable, containing as they do, information obtained from years of experience on the part of the writers. The present articles deal with the sulphite pulp processes in all their various detail and give a most exhaustive description of the methods now in use. The writer, Mr. G. B. Steffanson, is one of the best known and best informed men on this subject in Canada. His experience has been gained in various countries and he is therefore thoroughly familiar with his subject. These articles should be of great help to young paper-makers and those anxious to grasp every opportunity to further their knowledge on pulp and paper manufacture.

During the past few weeks a large number of young engineers have obtained their degrees in the universities throughout the country, many of whom are looking to the pulp and paper industry as a possible field. Many of these men have already had some experience in the mills. They are chuck-full of theory and are after the practical application. It is to their advantage to get as much information as possible and one of the best ways of securing that practical knowledge is by studying the technical journals devoted to the pulp and paper industry. There they will find valuable information derived from experiences of authorities throughout the world, which will be of great assistance to them in their work and study.

Manufacturers should encourage this sort of study by providing the proper facilities. Many of their employees require encouragement, even to read the trade and technical journals, and it is undoubtedly advantageous to the running of the plant to have men in charge, or on the machines, who are familiar with difficult processes and methods and therefore able to make practical suggestions. The majority of these articles are not written and compiled with the monetary return as the stimulant. They are written in an effort to spread information, to be of benefit to those who have not had the opportunity of studying the subjects discussed. Trade secrets are rapidly becoming a thing of the past, especially so far as technical knowledge of manufacturing is concerned, and co-operation is becoming more and more the secret of success. It is to the profit of the employers to see that every advantage is taken of these opportunities.

The Weatherhead Paper Co., Ltd., of Toronto, Ont., has taken out an Ontario charter. The capital is \$40,000.

MANUFACTURE OF SULPHITE WOOD PULP

By G. B. STEFFANSON.

(Specially written for the Pulp and Paper Magazine).

ARTICLE II.

(Continued from Last Issue.)

It is important to use limestone which is as free from silicious matter and clay as possible, in order to avoid frequent and costly cleaning of the acid plant and handling of much valueless material.

Marble is considered the best stone for all limestone systems.

The high tower system is apparently displacing all other systems in Europe, and even on this continent it seems to be gaining ground. The high towers are more expensive to install than any of the other systems, and the running cost is somewhat higher because the limestone must be hoisted to the top of the tower for charging, but they offer many advantages in other directions. The acid or gas does not come into contact with any pumps or valves before it is ready to be conveyed into the storage tanks, and therefore many costly repairs and renewals are avoided.

The High Tower System.

The system consists of four or more round tanks, 100 to 120 ft. high or even higher, usually 8 to 10 ft. in diameter, made of hard acid-resisting wood. The tanks are slightly tapering upwards, and are lined with acid resisting brick or boards, in order to avoid wear and tear of the tanks by the limestone.

The tanks are joined, and surrounded with a wooden structure, to form a tower, divided into a convenient number of floors, from which the tanks can be entered if this should prove necessary. The different floors are connected with the ground and with the top floor by means of stairs and a limestone hoist, as well as a passenger lift.

A water tank is placed on the top of the tower, which should be sufficient capacity to supply the tower with water for a few hours, in case the water supply should break down. The water in this tank is also used for washing out the tanks periodically, in order to free them from materials which could spoil the draught. This tank is, if possible, supplied with spring water, by means of a pump. This pump, and the hoist and lift, are the only pieces of machinery in connection with the tower.

The high tanks act as smokestacks and no forced draught is required unless pyrite burners are used.

The water is distributed over the limestone in the tanks in suitable quantities by means of sprinklers or other arrangements, so that it is evenly distributed and drips down through the limestone and keeps the surface of this moist.

The limestone in the tanks which should vary in size from pieces the size of a cocoanut to a large cabbage, is supported on stout oak beams about 10 ft. from the bottom of the tanks. A number of beams placed closer together are provided about one foot above the outlet for the acid, in order to catch the smaller pieces of limestone falling through the upper coarser grates and hold them till dissolved.

The water trickles down over the limestone and dissolves the SO_2 , which then dissolves the limestone, finally forming the acid bisulphite solution of the composition already mentioned.

The cooled SO_2 is distributed to the different tanks by means of lead pipes fitted with water seals, so that any one of the tanks can be disconnected from the system. The acid overflow a few feet from the bottom of the tanks into a settling tank, and is finally pumped or run by gravity into the storage tanks.

The bottom of the tanks are made to slant towards the mud holes, which should discharge into a sewer, and at the mud-holes are usually arranged water pipes with sprays, in order to prevent the smell of SO_2 when the sludge is washed out.

This washing out must be done at intervals of from one to four weeks, varying with the purity of the limestone and the design of the tanks, in order to prevent too much sludge from going into the settling and storage tanks. When this tower system is used, the escape of SO_2 at the top of the tower should be carefully controlled, specially in summer time and when cold spring water is not used; the water supply to the tanks should be adjustable from the bottom of the tower.

Low Towers System Cheaper.

The system of low towers, 35 to 50 ft. high, with 4 or more round or square tanks, connected as described above, is cheaper in first cost but presents many disadvantages. Two tanks are worked together in such a way that the gas rises through the first tower and is passed to the bottom of the second tank through earthenware pipes and finally goes up this tower. In order to obtain the necessary draught the tanks must be closed at the tops and a fan or steam ejector provided on top of the second tank. The weak acid from the second tower is pumped to the first tower. The machinery required for this system is costly to maintain in good order. In these towers the limestone usually rests on beams on the level of each floor of the tower, and the charging done from the different floors. This increases the cost of charging and cleaning considerably. The charging cannot be done every day, but at intervals of one or two weeks, and thus the acid contains too much lime immediately after charging the tanks, and is deficient in lime before charging, unless the mill is so large that several systems of tanks are in use, when this unevenness of the lime in the acid is eliminated. With regard to water supply, gas connections, acid connections, and settling tanks, the low towers are arranged in the same way as the high towers.

Instead of using towers, four or more tanks can be connected in series, as described in connection with the low towers. This system is very expensive in upkeep, and is in use in only a few of the oldest mills in Europe.

The Chamber System.

The cheapest limestone system of all as regards first cost is the chamber system. If the waste gases can be taken to a chimney each system only requires two phosphor bronze pumps. The apparatus consists of two long square chambers which are built together and connected, and each divided into 8 or more compart-

These chambers alternate at the top and at the bottom. This system is not automatic. In one chamber a quantity of water is admitted, and the other chamber contains weak acid. The gas is drawn through the top of the next one, and then in the same way through the chamber containing the weak acid so that it passes up through one compartment and through the second chamber, containing the water. Each chamber has a circulating pump, which takes the acid from the bottom of the chambers through a pipe with branches going into each compartment. The liquid is spread over the whole of the compartment by means of sprinklers, and trickles down through the lime stone, which rests on grates a few feet above the surface of the liquid.

When the acid in the first chamber is strong enough, it is drawn off and water admitted. The gas is then drawn through the system in the opposite direction, i.e., again first through the weak acid and then through the water. The reversing arrangements should only be water sealed, as the necessary suction is only $\frac{3}{4}$ ins. of water or slightly more. In a few Scandinavian mills, chamber systems with three chambers are used, and some of the mills have made them working continuously, in which case it is necessary to add a gas saver so as not to lose too much gas.

Milk of Lime Systems Most Usual Here.

The milk of lime systems consisting of closed tanks are the most usual on this continent, but they are used in very few mills in Europe. They all work on the principle of drawing the gas through one or more tanks nearly full of liquid, in which the SO_2 is absorbed and the lime dissolved. These tank systems are undoubtedly the cheapest of all acid making apparatus from the point of view of first cost, and are very easy to handle, but show several disadvantages. The cost of burning the lime has already been mentioned. The vacuum required is considerable, amounting to more than the combined height of the liquid in the tanks, and the air pumps are large, and need considerable maintaining in order to work properly. The tanks and connections must be kept perfectly air tight. The systems are usually difficult to adjust with regard to the quantity of acid made, except within narrow limits, and interruptions in the run cause large losses.

There are three essentially different types, viz., Burgess', Stebbin's, and Barker's systems. The Burgess apparatus is usually made in the form of one high tank, which is divided into three parts by means of horizontal partitions. The tank is fitted with a stirrer with hollow shaft and arms. The gas passes through the shaft and the perforated hollow arms into the lowest compartment, and then in the same way up to the upper compartments, being intimately mixed with the liquid when the arms of the stirrer pass through it. Stebbin's apparatus consists of two or more tanks usually arranged in steps, and provided with stirrers and two or more partitions in each tank with holes so arranged that the gas, which is drawn in at the bottom, must pass from one side of the tank to the other, so as to come into as intimate contact as possible with the liquid in the tanks. Barker's apparatus consists of a high tank provided with three or more horizontal perforated partitions. The gas is drawn in at the bottom and passes up through the liquid and the perforated partitions.

All these tanks are provided with overflow pipes for the acid from a higher tank or compartment to a

lower one, and the gas pipes are U shaped to prevent acid from being drawn from a higher tank to a lower one through these pipes. Milk of lime is admitted continuously to the top tank, and in such quantities that the acid flowing from the bottom tank is clear, i.e., that all the lime is dissolved. The composition of the acid is regulated by the quantity of lime charged in the milk of lime tank, care should, however, be taken that the milk of lime is not too rich in lime, in which case large quantities of SO_2 will escape through the suction pumps or ejectors if the acid is run clear.

Low towers for milk of lime are in use in only a few mills in Europe. The system consists of three or more towers 25 to 40 ft. high connected in series, and each provided with a covered feed tank with stirrer and pump. Artificial draught, giving a vacuum of 3 to 4 ins. of water is necessary, and is usually created by means of a fan or a steam ejector. The towers are fitted with stones or pieces of wood, so as to provide a large area of contact for the liquid and the gas. The disadvantage of this system is that the tanks become clogged with calcium sulphate, and the cleaning is expensive, and requires much time, as the gypsum sticks to the filling materials.

Several combinations of the above systems are also in use, but it is outside the scope of this article to discuss them.

Important Instructions.

When using milk of lime systems for acid making, it is very important to slake the lime properly. Two methods of slaking are in use. The quick lime is dumped into tanks filled with water provided with agitators, and the liquid is heated to boiling. The milk of lime is then screened before going into the storage tanks. By the other method the lime is slaked in koller gangs or troughs, with the minimum quantity of water, and is then washed into the storage tanks over wire screens and diluted to proper consistency. The second method requires more labour but saves lime and steam. Milk of lime should always be stored in such quantities that it has time to cool down before being admitted into the acid apparatus, as the absorption of SO_2 by the water diminishes very rapidly with increasing temperatures. The storage tanks for milk of lime should always be provided with efficient stirrers.

The acid storage tanks should be so arranged that any leaks can be readily detected. The tanks should also be covered and fitted with gas pipes leading into the acid making system, or to the gas reclaiming plant if more convenient.

The acid storage tanks may be made of concrete, sheet iron, or wood-lined with acid resisting brick, or even common red brick, well pressed and burnt, set in acid proof mortar, and with or without a lead lining behind the bricks. Tanks made of hard pine are cheap, and can be used for many years without lining, they can later be lined with brick and acid proof mortar.

If possible a 24-hours' or more supply of acid should be stored, and the storage tanks should be so arranged that the raw acid coming from the acid making plant, can be blown with SO_2 from the relief and blowing off of the digesters, before it is mixed with the finished cooking acid.

In this connection may be mentioned the cooling of the gas from the digesters, before it is blown into the acid. The cooling of the gas has to be carried far enough to prevent the temperature of the acid from

rising to more than 120 deg. F., otherwise calcium sulphite may separate. The gas pipes from the coolers should be placed in the bottom of the blowing storage tank, so as to produce circulation of the acid, in order to prevent overheating of any part of the acid.

On the other hand the acid should be heated by the gases from the digesters to at least 100 deg. F. in order to save steam.

The gas coolers are either made in the form of lead coils in circular tanks, or an elongated system of pipes of the same diameter as the relief pipes from the digesters, laid in a shallow trough.

Water is preferably and almost exclusively used for the purpose of cooling the gases, only a few old Mitscherlich mills still use the original air cooling in long c. i. pipes.

The raw materials used in acid making should all be tested by a skilled chemist, and any leakage of gas should be carefully guarded against. The escape of any SO_2 from the acid making apparatus should be carefully checked or else great waste may occur.

For an economical running of the plant supervision in other directions is also essential. The burning of the sulphur should be complete combustion, without a large excess of air being admitted. The pyrite burners should always be kept perfectly air tight, except for the proper inlet of air.

The composition of the gas should be ascertained and the cooking acid should be blown to its correct temperature and composition.

The composition of the waste gases leaving the acid system can be periodically followed by means of Orsat's apparatus, or other apparatus constructed for the purpose. The use of this apparatus need not be described here, it can be learnt from the dealer, or from the chemist. The gas coming from the burners should also be analysed.

Automatic Self-Registers Essential.

It is essential to arrange automatic self-registering instruments in all places where the contents of SO_2 in the gas has to be ascertained. An excess of air in the SO_2 gas causes difficulties, because the moisture in the air admitted, as well as that in the sulphur or pyrites, form steam in the burners, which causes the formation of sulphuric anhydride (SO_3), which in contact with lime forms gypsum (CaSO_4). The insoluble gypsum causes deposits and clogging, particularly in limestone systems and this causes considerable loss of sulphur and lime. This trouble seems to have made the limestone systems unpopular when they were first used on this continent. The gas from the burners in plants which are run carelessly, contains frequently only 7 to 8 per cent of SO_2 . The contents of SO_2 in the gas should not fall below 12 or 14 per cent for pyrite burners, and can under favorable circumstances amount to 16 or even 18 per cent in gas from sulphur burners. The theoretical amount of about 21 per cent cannot be obtained without sublimation of sulphur, and subsequent clogging of the coolers and waste of sulphur.

Sublimation may occur even with a low per cent of SO_2 in the gas, if the temperature in the burner is too high, and no secondary air is admitted behind the burners, so as to promote the combustion of the sublimed sulphur in the combustion chamber.

It is of great importance where milk of lime systems are used, to keep the composition of the acid constant, both when it comes from the acid apparatus, and when it has been blown with gas from the digesters. It

has in most of these systems proved impossible to make an acid of proper strength without considerable loss of SO_2 , and to remedy this, separators have been used to separate condensed steam from the SO_2 gas coming from the digesters, and in this way get the blown acid up to proper strength.

In lime stone systems this is not necessary. The ratio of free and combined SO_2 should here be kept constant, and the acid should be made so strong that after blowing with the cooled gases from the digesters, without previous separation of condensed steam, it should be of proper strength for cooking, or stronger as it is easy to dilute it.

In order to get a uniform pulp, and not waste chemicals, the digesters should always be charged with the same quantity of free and combined SO_2 , and not, as is very often practised, charged with a certain quantity of acid, regardless of its composition.

Green wood needs a somewhat stronger acid than dry wood. Care should be taken, however, that enough acid is charged to prevent burning of the chips in the upper part of the digester, by the steam.

The Analysis of the Acid.

The analysis of the acid is best done by titration with N-10 Iodine Solution and N-10 caustic soda solution. One c.c. of the acid is diluted, starch solution added and titrated with the iodine, until a permanent blue color is obtained. The blue color is then destroyed by means of a few drops of sodium thio-sulphate solution. A few drops of phenolphthalein solution are added, and caustic soda run in until a red colour is obtained. The number of c.c. of iodine solution added indicates the total amount of SO_2 present, and the difference between double the quantity of iodine solution, and the quantity of caustic soda solution used, indicates the amount of combined SO_2 .

Multiplying by 0.32 gives the percentage of free and combined SO_2 in the acid. The percentage of lime (CaO) in the acid is to the combined SO_2 , as 28 to 32. This test does not give an absolutely correct result, due to the fact that some of the SO_2 evaporates during the test, and to other reasons, but made with care, this test will give a result accurate enough for all practical purposes.

Capacity of Acid Plant.

It is difficult to give absolute figures for the capacity of the different machines and apparatus in an acid plant, but below will be given some approximate figures calculated in tons of pulp per day.

The ordinary retort burner is sufficient for $2\frac{1}{2}$ to 5 tons production.

Rotary burners are built for all productions up to 40 tons. The standard Herreshoffs pyrite burner is sufficient for 12.5 tons.

The capacity of gas coolers has already been mentioned.

Each tank in a high tower system gives acid for 12 to 15 tons, and low towers in series, about the same.

Chamber systems are built for up to 30 tons.

Milk of lime systems are built for all productions up to 100 tons.

Digesters and the Cooking.

There are two different methods of cooking, the heating by indirect steam, and the cooking with direct steam, in some mills these systems are combined.

Mitscherlich (extra strong, as well as bleachable and ordinary strong pulp, is cooked with indirect

lining, and a connection with direct steam; or direct steam and "quick cooked" pulp is invariably used with direct steam.

The old types are of varying size and construction. In old mills there are still in use digesters with a capacity of two tons or even less, lying stationary, as well as others supported on rollers or on bearings. The most commonly used digester is, however, the standing stationary type of five to fifteen tons capacity.

The best type of this digester is one with the diameter about one-third of the total length, the lower end consisting of a cone of about 60 deg., ending in a blow-off pipe, and the upper end consisting of a cone of about 110 deg., ending in a good sized manhole. This latter design enables the digester to be well filled with chips in a short time, and without too much work.

Digesters are now without exception lined with single or double layers of acid proof bricks set in acid proof mortar, with or without a sheet lead jacket behind. Usually the bricks are three and two inches thick, respectively, in some cases bricks as thin as $1\frac{1}{4}$ ins. are used, in order to save space, but they are just as expensive as thicker bricks, and do not stand wear and tear as well.

Only non-porous bricks should be used, and they should be set one half inch apart, to make it easy to clean the joints of mortar affected by the acid, and replace it. Well pressed and burnt red bricks are nowadays extensively used for digester lining, but tests should be made, before a new brand of these bricks are used, as bricks apparently not porous may turn out to be porous when used.

Acid proof mortar is usually composed of one part of Portland cement to one or two parts of crushed and sifted acid proof brick, often in combination with litharge and asbestos. In order to get the mortar to harden quickly, it is made with a 4 degree Be. solution of silicate of soda instead of water, and this silicate of soda is during the first cook transformed into an acid proof compound. Care should be taken that no part of the mortar hardens before it is put in position in the lining, as it is liable to break up when applied, and form weak spots in the lining.

Where the digester shells are not absolutely tight, one should line the digester first with a jacket of thin sheet lead, perfectly tight, because the acid is liable to work its way through the mortar to every leak. The lead lining however, has its weak points, as it creeps and buckles from the effect of the difference in temperature and separates the lining from the shell, which must be perfectly smooth inside, in order not to wear the lead out too quickly.

The best way to get a good reliable lining is to see that the digester shell is perfectly tight, at a hydraulic pressure one and a half times as high as the working pressure. The shell is next lined with a one inch layer of mortar which is not brittle, i.e. acid-proof mortar mixed with a considerable amount of asbestos, or fat soap, or both. On this is laid one layer of 3 inches, or two layers of thinner acid-proof brick.

The joints of the last layer of bricks can be filled with a mortar of about one half inch with a mortar of oil-soluble and especially prepared glycerine, which is not brittle, and will not be brittle and does not lose time to time and renewed. This mortar is used to secure the acid from attack on the joints of the bricks.

The joints of the acid proof pipes, and up to the digester, should be lined with acid proof metal.

cleaned but rough, but should not end up against lead. Where lead lining is used the main body of the shell is covered with about $\frac{1}{4}$ inch sheet lead with about $\frac{1}{2}$ inch lead at all pipe inlets and manholes.

The Necessary Fittings are two inlet pipes for steam, at or near the bottom of the digester, blow-off valve right at the bottom, or a manhole where the pulp is discharged by gravity, two outlet pipes for gas at the top of the digester, steam pressure gauge, thermometer pocket, and sample cocks. Sometimes digesters are arranged with only one pipe outlet at the top of the digester, combined with an acid proof pipe with valve connections to acid pipe, blow off gas pipes, steam gauge, etc.

By indirect cooking 5 to 8 inlet holes for steam are arranged at or near the middle of the digester, and as many at or near the bottom, each hole provided with a valve and check valve respectively, at inlet and outlet. The inlet and outlet holes are connected inside the digester by means of copper pipes, laid spirally round the digester and supported by acid proof racks.

The blow off valve should be of ample size, not less than 8 inches, connected to an acid proof bend on the bottom of the digester. Where there is water available of a higher pressure than the blow-off pressure a water connection should be fitted to this bend, so arranged that the water goes in the same direction as the pulp, but it must be taken into consideration that this cold water gets available rosin to adhere to the fibres, and this scheme should therefore not be used where there is a large percentage of rosin in the wood.

Steam can also be used to quicken the blowing off, and is arranged in the same way as above mentioned, for water. The blow-off valve should be so constructed that it gives as little resistance as possible to the pulp.

The pipes from the digesters to blow pits can be made either of thin copper or c.i. The pitch in the blown off liquor will corrode the c.i. pipes and prevent the SO₂ gas left in the liquor from affecting the pipe. Pipes from acid storage tanks to digesters should be made of copper or hard lead, pipes from digesters to coolers should be made of extra hard lead (3 per cent antimony) or even better of copper, which, however, is more expensive. The fittings on the digesters should be made of best quality phosphor bronze, other acid proof fittings can be made of cheaper materials.

In older mills where scrap metal is available, and where a considerable crew has to be kept for the Sunday repairs, and which crew it is often hard to find work for during the week days, it will pay to make these fittings. All kinds of scrap metal, old brass bearings, valves, etc., are melted in a graphite crucible, and the zinc well "burnt off." To every 6 lbs. of this burnt off metal add 10 lbs. of phosphorous tin and 30 to 35 lbs. of scrap lead. Cast at as low a temperature as possible and stir well in the crucible before and during the casting, preferably with well dried hard wood branches with the bark left intact, in order to get the oxides of the metals to the surface.

This metal resists the acid well, and can be used in casting pumps, valves, etc., but should not be used for digester fittings.

Gas pipes from the digesters to the coolers and acid storage tanks should be 3 to 4 inches in diameter, depending on the size of the digesters. In case screens are arranged inside the digesters to prevent chips and pulp from plugging the gas pipes, these should be made so that no chips can collect on or near them,

as these chips will be burnt by the steam during the cooking, and form black specks in the pulp which cannot be bleached.

The cooler should be fitted with pipes of the same diameter as the gas pipes, and made preferably of thin copper, which will make the cooler more effective than if lead pipes are used. The cooler consists as above mentioned of either a high rough tank with a coil of pipes, a shallow round tank with the pipes arranged in a spiral, or a square tank with straight pipes connected at the ends in such a way that the gas has to pass through all the pipes. This latter arrangement is the cheapest in upkeep, and these coolers are easily accessible for repairs, but take a lot of space.

The cooler should be large enough to cool the gas down to about 160 deg. F. in the summer time and the cooling water regulated so as to keep the temperature even all the year round.

The direct steam inlet to the digester should be connected to a coil of lead or copper pipe inside the digester, placed near the bottom and perforated so that the steam is directed up the sides of the digester, thus causing a downgoing current in the middle. In this way a thorough circulation is obtained and the pulp is cooked evenly. It is also necessary to have a small steam inlet right at the bottom of the digester to cook the chips there, and to prevent uncooked chips in the pulp. This steam inlet should also be connected to a small coil provided with perforations.

The Number and Size of Digesters

should to some extent be dependent on the size of the mill. To prevent waste of coal due to a widely varying consumption of steam, the number of digesters should not be less than four, this especially where the sulphite mill has its own independent boiler system.

There are many ways to conduct a cook, differing not only with the quality of the pulp produced, but nearly every sulphite pulp maker has his own ideas of the best way to get a good result. I will here first describe one way to obtain in a first quality easy bleaching pulp.

The steam pressure should be about 75 lbs. time for cooking 11 to 12 hours, and the acid test about 3.7 per cent total SO_2 of which 75 per cent is free and 25 per cent combined. Chips are run in and the cover applied and tightened. Steam is put on from the top of the digester, through the above mentioned pipe with valve connections and is left on until steam comes out through a condensed steam valve at the bottom which has been open all the time the steam has been on, to allow the air and condensed steam in the digester to escape. The steam is then shut off, the condensed steam valve closed, and acid run in without opening the cover. The time required to run the acid in is considerably shortened by the vacuum in the digester, caused by the condensing of the steam. In this case an acid gauge glass at the top of the digester is essential, as well as a small air valve to prevent too large a vacuum. The steam is now turned on from the bottom of the digester. When the pressure in digester, after two or three hours, depending on the size of the digester, is at 75 lbs., the relief valve is opened slightly and the temperature brought up to about 240 deg. F. in the course of an hour. Now the steam and relief valves are both shut for one, or one and a half hours, after which time the steam is turned

on and the relief valve slightly opened again. The maximum temperature of about 300 F. should be reached in about 10 hours, with the pressure still about 75 lbs. The steam is now shut off, but the relief valve is kept open, and the pressure should in one or two hours go down to about 50 lbs., when the digester is blown. The liquor should now by test show about 5-100 of 1 per cent of SO_2 .

If the cooking is allowed to go on until the liquor by test shows no trace of SO_2 , i.e. no bisulphite is left, the cook is more or less "burnt," depending on the length of time it has been going on without bisulphite. The liquor as well as the dry pulp from a "burnt" cook, has a peculiar smell, the pulp is sometimes brown in color, and very soft and spongy. This pulp bleaches very easily, but makes a very soft paper, can never be bleached to a high color, and the yield of pulp is considerably below normal.

A quick way to determine whether there is any bisulphite left in the digester, is to pour a few drops of ammonia into a sample of the liquor. If a precipitate forms there is still bisulphite left, and from the quantity of the quick settling precipitate, the quantity of bisulphite left in the digester can easily be judged.

It is not absolutely necessary to steam the chips, but this makes them more evenly moistened, and drives most of the air out of the digester, thus helping to make a better quality of pulp.

Care should be taken that the vacuum in the digester does not get too large, either when admitting the acid after steaming or during the blowing, as the vacuum has a detrimental effect on the lining.

To close the steam as well as the relief valve for some time after the digester is boiling, helps to make a finer and more evenly cooked pulp, but also prolongs the cooking process to some extent.

Blowing the Digesters.

Digesters are sometimes blown from full pressure, sometimes from a pressure of only 15 lbs. the best pressure for blowing is, however, from 40 to 60 lbs. If the digester is blown from too high a pressure, some of the uncooked chips and knots will be blown to pieces, and brown slivers will occur in the pulp. On the other hand, if the digester is relieved too low before the cook is blown, the acid in the acid tanks will be too much diluted by condensed steam, as most of the SO_2 gas disappears from the digester at a higher pressure. This has specially to be taken under consideration in mills where a strong raw acid cannot be made.

In case too weak an acid has been charged in the digester or too much gas has been relieved during first part of the process, and a sample of the pulp indicates that the pulp will not be ready by the time all the SO_2 is exhausted, this can to some extent be remedied by closing the relief valve and drawing liquor from the bottom in quantity corresponding to the condensed steam in the digester, in order to give room for fresh steam. Some mills use this method continuously, and relieve from the top, only in the beginning of the cooking process, to get rid of the air in the digester, and at the end of the process to get the pressure down. They must, however, have a separator to separate the liquor from the gas, which latter is sent to a cooler, and the acid tanks. This system saves coal as this outgoing liquor only contains the heat necessary to heat it, whereas in relieving from the top, the latent heat of the steam escapes as well. In this case the

and must be done in combined SO_2 , and the cooking will take more time.

Ordinary Quick Cooked Sulphite Pulp

is extensively manufactured on this continent, but hardly any European mills make this kind of pulp now, as they have found that it pays them better to make either the higher priced bleachable pulp, or else to make strong pulp which is cheaper in production than the "quick cooked" pulp.

The "Quick Cooked" Pulp

is cooked in much the same way as the bleachable pulp. The steam pressure employed varies from 75 to 105 lbs. and the time of cooking from 6 to 10 hours. The chips are usually not steamed, and often acid of as much as 4.8 per cent total SO_2 is employed. The pulp when ready is sometimes blown into the blow pipes from full pressure, with a tremendous loss of SO_2 .

An economical way of cooking this pulp is as follows. Steam the chips, use 75 to 80 lbs. steam pressure, and acid of about 3.7 per cent SO_2 and about 1 per cent combined SO_2 . Relieve carefully during the whole cooking process, shut off the steam about one hour before the pulp is ready, and relieve down to 50 or 60 lbs. pressure and blow the pulp. This process will take 9 to 10 hours and about one hour more from blow off to blow off, repairs included.

For indirect cooking more apparatus must be employed, i.e., the above mentioned copper coils in the digester, with couplings, inlet and outlet arrangements with valves and check valves, a system of steam pipes so arranged that the steam can be sent from coil to coil in succession in any of two or three digesters, and outlet to the feed water heater or other arrangement to utilize the rest of the heat in the condensed steam. Coils in the digesters should preferably be made of electrolytic copper, which is the best conductor for the heat of the steam into the contents of the digester. The fittings should be made of phosphor bronze. The system of steam pipes connecting the digester coils, as well as pipes and the protection mantle in the feed water heater, should be made of copper or phosphor bronze as it sometimes happens that the coils in the digesters break.

Coils and steam pipes are usually made $1\frac{1}{2}$ ins. in diameter. The process of cooking with indirect steam varies considerably with the quality of pulp produced. Steam from 60 to 100 lbs. pressure is employed. The acid varies from 3.5 to 4.5 per cent, total SO_2 , of which 20 to 35 per cent is combined SO_2 .

In the original Mitscherlich process steam of about 60 lbs. was used, with acid 3.6 per cent, total SO_2 , of which about 33 per cent was combined, and the time of cooking was up to 60 hours. Most of the strong sulphite pulp on the market is now, however, cooked in a much shorter time. The bleachable Mitscherlich of the present is very seldom cooked more than 40 hours, and usually not over 24 hours.

The following method can be considered the Standard method.

Cooking "Strong" Pulp.

Steam pressure about 75 lbs. (in which case the steam should be sent in about 90 lbs. working pressure) and the pressure in the digester rises above 100 lbs. as the steam in the coils.

Use about 3.5 total and 0.9 per cent combined SO_2 (about 4 per cent). The chips are steamed, and acid run in until it is nearly full in the digesters. Steam, that

has already passed the coils of one or two other digesters, is first turned on the coils, and "live" steam is not applied till the other digesters are finished cooking. When the digester is under pressure, relieve carefully for a few minutes, to get rid of the air in the digester, and repeat this two or three times during the next hour.

Steam pressure is kept on the coils all through the cooking process, which takes from 13 to 16 hours. Care should be taken to watch the cooking during the latter part of the process, as the chips, with the strong acid and high temperature at the end of the cooking, very quickly turn into pulp.

About one hour before the cook is ready, the steam should be shut off the coil and the digester relieved down to about 50 lbs., and blown. Care should be taken that the digester is not relieved too quickly, or else the pulp may not be cooked by the time most of the SO_2 gas is exhausted.

In some mills direct as well as indirect steam are applied at the beginning of the cooking, to get the pressure in the digester up quickly, in order to shorten the time of cooking. The direct steam is, however, usually discontinued when the digester is at a temperature of about 140 deg. F., or even sometimes at 200 deg. F. In this case the digester should not be filled with too much acid. Care must also be taken to make room for the condensed steam from the direct steam. This can be done by drawing some acid from the bottom of the digester, which acid can be sent back to the acid tanks.

A good way to press the acid into the chips before the digester is under steam pressure is to apply hydraulic pressure corresponding to the steam pressure. When the acid is run into the digester with the cover off, the cover should not be applied before the temperature of the digester contents is about 150 deg. F. This will help to remove the larger part of the air from the chips and the digester.

Most cooks judge whether the cook is ready or not, and whether the cooking is going on regularly, by the smell and color of the liquor. Sometimes, however, he will find that the cooking is not going regularly, and does not know or cannot find the reason. Now it is of importance to have arrangements to take a sample of the pulp in the digester, to determine what to do in order to get a proper cook.

Judging Quality of the Pulp.

An even grade of pulp can be obtained by judging the quality of the pulp by dipping a well washed and squeezed sample of pulp in a 4 deg. Be. bleach liquor, sampling from the digester until the pulp shows the desired color when dipped in the bleach. A quick way to determine whether there is any combined SO_2 (bisulphite) in the liquor is the ammonia test prescribed above. The best way, however, to determine the progress of the cooking is by titrating with N 100 iodine solution.

When cooking strong pulp one way to determine the quality of the pulp is to shake a well washed small sample in a high glass, and judge the quality from the appearance of the fibre.

The pressure as well as the temperature of the digester should always be watched carefully, and if any irregularity occurs the reason be found and remedied, otherwise it is impossible to obtain a good even grade of pulp.

Care should be taken that everything is made as convenient as possible for the men to charge the digester

quickly, by providing good sized pipes for acid, reliable acid pump, large manhole at the top of the digester, easily accessible blow-off valve, and other valves, and fittings of a standard type to allow quick exchange of any broken or worn out part, etc.

The time of charging the digester from blow-off to "steam on" varies from one half to one hour, and should never take more time than this, even for the largest digesters.

The output of pulp in a given digester space depends on the kind of pulp made, the way the chips are filled in the digesters, and the size and quality of the chips.

Mitscherlich and ordinary strong pulp requires 400 to 425, "Quick-cooked" pulp about 450, and easy bleaching pulp 475 to 500 cub. ft. digester space per short ton air dry pulp.

Blow Pits.

The blow pits should be built so low down that the blow pipes from the digesters are horizontal. The blow pipes should enter near the top of the blow pits. Pits are usually square or round covered tanks, made of hard wood or of well pressed red bricks in cement mortar, and with a cover of hard wood. Concrete tanks are not to be recommended, as the hot liquor affects the concrete. Woods such as hard pine, southern pine, and even white pine, resist the action of the liquor for years.

The bottom of the pit should be inclined towards a hole in the bottom, where the outlet for liquor ends in a quick opening flange or gate valve, above the sewer system. A false bottom is arranged from 12 to 15 ins. above the bottom, made of hard wood planks (pine) standing on edge, but so arranged that the liquor can freely run underneath to the outlet. Perforated drainage tiles are supported by these planks and in laying of the tiles, one inch dry laths should be laid between each row. When these laths swell by the contact with the hot liquor, the tiles will be held securely in place.

Above the false bottom is arranged an outlet to a pulp pump or agitator chest. The false bottom should preferably be inclined towards this pipe.

An ample outlet for the steam from the pit should be provided. This should be placed where the pulp cannot escape with the steam, and should be made of pine, and may conveniently be carried over the roof of the digester room. Where square blow pits are used, and placed together, i.e., built in one structure, two or four pits are connected to one steam escape, but care should then be taken that this is so dimensioned that steam does not go into the other pits when the dampers are closed.

In case each digester has its separate pit, this should be large enough to hold at least two cooks, and the digesters should never be charged before there is ample room in the pit, otherwise a break down in the wet end of the mill might also cause the loss of a cook by "burning" it.

When the cook is blown, the flange at the liquor outlet pipe is opened, and the liquor is let out of the pit. Water preferably hot, is then admitted from the top of the pit, and in such quantities that the water level is over the pulp, this in order to get the pulp takes from 4 to 6 hours with cold water, the water is thoroughly washed. When the pulp is washed, which shut off and the pulp drained. Now the liquor outlet flange is closed water is again admitted from the top

to nearly fill the blow pit, and a hose of ample size and good water pressure is used, first to loosen the pulp round the pulp outlet pipe, and later during the emptying of the pit, to force the pulp to the outlet. The pulp outlet pipe should be provided with a gate valve, to make it possible to repair pipes and pumps during the washing of the pulp. To prevent stones and other heavy articles getting sucked into the pump and breaking the rotor, a trap should be arranged.

(To be continued).

POINTS WORTH KNOWING.

1—The conveyance of the finished pulp from the edge-runners is economical not only with trucks, belts and elevators. The pulp can also be emptied into a mixing-chest and after being diluted with water conveyed through pipes.

2—Bad mechanical wood-pulp made from decayed timber or fibres beaten dead can never yield a paper of good bulk. Neither special beating nor tending of the machine can obviate this defect.

3—For Chinese coated papers the selection of the mechanical wood pulp is by no means a matter of no importance. A high class pulp made with high power grinders is absolutely necessary.

4—Absorbing papers may not have the greatest possible absorbability in all cases, because many papers are recently being printed on both sides instead of being painted.

5—The color tone for printing papers is by no means not always reckoned for daylight. A complaint with regard to this was due to the newspaper in question being mostly read in the evening.

6—Opaque tissue paper need not always consist of 100 per cent rags. Papers made from pure chemical pulp likewise have a rag-like character when cold bleached soda-cellulose and a few percent of white paper shavings are added.

7—Ordinary newspaper does not always need to be liberated from printer's ink in order to be able to use it again. For toilet paper up to 10 per cent, and for rotary running up to 40 per cent waste newspaper sent through the edge-runners were employed with an admixture of tale and with specially careful tinting with indanthrene GGS and auramine.

8—Imitation parchment can be made perfectly ink-proof and grease-proof without any sizing. Owing to the omission of the size the fouling of the wires and felts and adherence to the press-rolls is diminished.

9—Papers containing mechanical wood-pulp are not always made in the beater. Frequently all the mechanical wood-pulp passes only through the edge-runners and, with the chemical pulp, through a mixing-beater and a pulp mill.

10—Grey wrapping papers are not always dyed most economically with green vitriol, potash blue or aniline. Black graphite forms an excellently cheap pigment which requires to be only tinted with aniline dye. Likewise grey tobacco papers are advantageously dyed with graphite instead of with the expensive and troublesome lamp-black or aniline dye which is not fast enough to light.—Der Papier Fabrikant.

CROWNS

"Uneasy lies the 'roll' that wears a crown."

By JOHN W. BRASSINGTON.

Specially written for the Pulp & Paper Magazine.

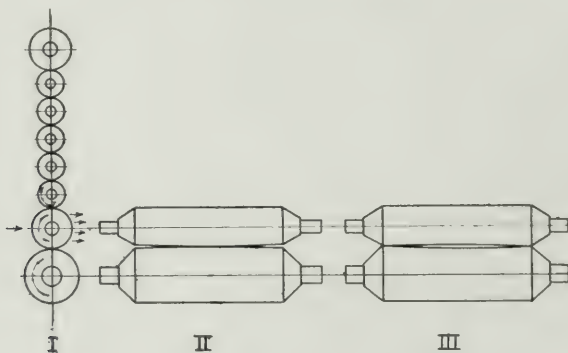
A Crown is the emblem of the divinity that doth hedge a king; when our ancestors in the German forests uplifted on their shields, he who was greatest in the field of battle, they acclaimed him Konning, he knows the King. To distinguish such a mortal from the common herd, he was crowned. Analysing the psychological aspect of this proceeding, we recognize that these ancient peoples elected to themselves a King and a Crown, because they were not able to move, as a unit for any given purpose, without a leader; lacking something essential in themselves, they tried to supplement their inefficiency with an addition that was redundant; such a proceeding was excusable in those mentally crepusculous times, but it seems a mean measure of our mechanical ability in this 20th century that we have to give a crown to our Paper Machine Rolls, because of something essential lacking in all that are made.

Before we get our Cyanometer into play, however, let us discuss why we, in this heyday of mechanics,

stiff a design as possible. There is a great big difference between designing for stiffness and rigidity, and designing for strength only. A good springy board is often strong enough to bear a body over a ditch, for instance, yet it may be the reverse of rigid or stiff. The upper Couch Roll Jacket is soft and yielding enough to compensate for any difference in pressure due to inaccurate corrective crowning.

When we consider the Press Rolls, we find that this is one of the crucial points of difference between one machine and another; the deflection of the lower Press Roll is controlled by first its own strength, due to design; second, by the amount of pressure per lineal inch of face, due to the weight of the upper roll and the weights and levers on the journals; and third, by the density of the rubber covering. If the reader will examine a pair of press rolls in operation, he will notice that the surface contact is about one inch wide for a pressure of about fifty pounds per inch of face for a rubber giving a Plastometer reading of 1.K., 125.40; a

DEFLECTION OF CALENDER ROLLS



have to do a wrong thing in order to correct an error already committed.

It is an exceptionally good Fourdrinier wire that is not a little short in the centre, because it is made on rolls that deflect under the strain of the process of working; it is not always that these rolls are corrected for this deflection by crowning, for this reason it is good practice to make the Breast Roll practically straight faced, so it will deflect the same amount as the wire is short in the middle.

When, however, we consider the Couch Roll, we have a complication of strains, one due to the pull of the fabric, this pull being greater at this, the driving point, than at any other; and one due to the pressure exerted by the top Couch Roll, and such weights as may be placed thereon, and another due to its own weight. The resulting stress is approximately at an angle of 30 degrees to a vertical line drawn through the centre of the bottom couch roll and meeting it at that centre. The machine designer, aware, here, is made as small as possible by constructing the lower couch as per as

roll of the right parabolic design would require a crown twenty-four per cent. greater than its calculated deflection for the given load; this being true for all widths of machine. Unfortunately, the pressure per lineal inch of face is under the control of the machine tender who, fine fellow as he is, often works by instinct instead of by law. This working by instinct is a fine thing in many ways, for instance, if you sit on a hot stove, you will rise instinctively, but it were nevertheless, better you had not sat down.

It is the necessity of correcting by crown, in part, by softness of covering, and by the use of weights and levers for what is after all an inherent error in design and construction, that has turned the thoughts of the designer towards the possibility of obviating the reason for crowning, by building a Non-deflectible Roll. The writer has been very enthusiastic lately in the study of a design of roll that seems to fill the bill by maintaining under varying conditions of load, a straight non-deflecting face, transferring all variations due to differences in load to the inner shaft by an ingenious me-

thod of uniformly supporting the load all over the outer shell, and concentrating the reacting stresses on the interior shaft; the writer followed up the design, manufacture and a severe test of one of these rolls, and the results obtained were in every respect clean cut and satisfactory; there is probably no reason why the paper maker should not order and obtain non-deflectible rolls for his paper machines, in the near future.

When we consider what an advantage such non-deflectible rolls, if successful, would give to the paper maker using them, we also begin to realize what a splendid work he has done in the past in spite of the handicaps under which the paper machine labored. If it is possible, as the writer believes, for the machine builder to furnish reliable non-deflectible rolls for the paper machine, then it will soon be every day practice to furnish definite weights and positions on the levers for those weights, for every grade and kind of paper the machine may be designed to make. Th rolls would not have to be crowned, nor would they have to be reground for a different weight of paper; the weights could be permanently locked in place in such a manner as to put it out of the power of the machine tender to tamper with them.

The length of life of the clothing would, under these conditions be considerably greater; let us thing for a minute of the inevitable effect of the crowning of say the press rolls on the felts: the centre of the felt must be constrained to travel faster continually, and this tendency must result in stretching the threads of the felt until the interstices assume a diamond shape instead of a rectangular parallelogramic contour this means a closure of the pores and a decided shortening of the time between necessary washings. The stretching of the centre of the felt also causes this portion, all other influences being equal, to wear away much faster, owing to the action of the whipper and the faster clogging of the nores as above described.

The following description of a Smoothing Roll testing operation in the shops of a prominent firm of Paper Machine Builders, gives a fair idea of the constant care and anxiety this question of crowning rolls for the work required of them gives to the makers of them:—

Here we are! The housings are in place on the surface plate and the brass or lower roll is resting its journals in their bearings. Smooth, in "dynamic" as well as static balance, this polished brass roll is constrained from turning by a clamp and lever, so it is ready for its first or deflective test. A micrometer is placed on the surface plate and a reading is taken of the distance between it and the bottom of the brass roll at every foot of face of the roll as well as at the two ends and at the middle; our Engineer shows us his once blank test record already filled in the first column with the readings we had watched being taken. Then here comes another man with the micrometer calipers, so that a record of the horizontal diameters of this much measured brass roll may be obtained and added to the figures already in place. This finished, two husky hustlers begin loading bags of sand onto the top of the roll, 100 pounds each bag, 28 of them; when these are all in place, the readings of the distance between the surface plate and the roll are again taken, as are also the horizontal diameter records, all being duly entered in the places provided for them.

"Deflection nine one thousandths," says our guide.

"Pretty stiff roll; thought it would go eleven," returns the Foreman of the Roll Shop.

"Soleroscope reading fairly high, probably accounts for it," remarks our guide, "only varied one point all along the face."

Now off come the bags to be piled away till the next roll comes in to be tested; all successful paper machine builders should test for static, for running balance, for deflection and crown, every roll that goes on a Paper Machine.

Now the big crane picks up the roller roll, and before placing it on top of the brass roll, it is tested for crown and for rubber density every foot of face with calipers, and with the Plastometer; finally the lower surface of it is covered with chalk and it is lowered into its bearings. Two men come forward, one to each housing, and the ratchets move carefully in unison until the two rolls touch, the levers being detached, so, therefore, there is no weight on the upper roll journals. Then follow more micrometer readings and caliper measurements of both rolls before the rubber roll is raised again to measure the varying breadth of the chalk line marked on the brass roll by the caress of the rubber.

"Crown a trifle small," says a roll expert, and the Engineer nods as he enters another long series of figures onto the test sheet.

The chalk mark is then wiped off the brass roll and more chalk put on the rubber roll; the upper roll is then again lowered onto its mate as carefully as before, so that one end does not touch before the other; but now the levers are hooked up and the weights are placed exactly half way on the levers at each housing. The same series of measurements are taken; the chalk line is a broad parallel mark from end to end of the brass roll.

"Crown is O. K.," says the Engineer.

"Not enough," says a roll expert, "she will show light in the middle when you move your weights out."

"Well, these people only make forty pound paper, and they ought not to overweight that grade of rubber for that weight of paper."

"Oh! pshaw; when the right man comes on, he'll move those weights anyhow, whether they need it or not."

"Well," says the Engineer, "let us be right as far as we go."

Then again the top roll is lifted and the whole process again repeated with the weights at the extremities of the levers. Finally, the rolls, the weights, the levers and the housings are marked so each will be rightly placed in the field to suit the crown, the density of the rubber, and the work the smoothing press is designed for. The weights and levers being painted red or white, show unmistakably the proper position.

"That pulley is to carry the wad past and outside the nip of the roll," explains our guide; "you see the paper is reversed at the third press, and the wire marks are underneath."

"The paper is passed over the top rubber roll and is guided by the passage of the wad on the pulley and belt into the nip where the even pressure gives a smooth finish or a finer surface."

"How do we know what crown, what density of rubber to use, and what weights for certain papers? By a great deal of experience seasoned with a fair modicum of theory. We can figure the deflection of any given roll, we can accurately measure the elasticity of the rubber, and we know the pressure per inch of face that will give good results; by combining all these pieces of information together, we are enabled to build a successful smoothing press. These tests are made to

only one work, which is done according to calculations. It is like anything else, you have to know how! After that success is certain reward of eternal vigilance."

"How many have we built? Between thirty and forty in the last few months; it's like this, if you can build anything better than anyone else, you'll find that Morrison's remark about the work making a beaten track to your door is pretty nearly right, provided you have a good Sales Department."

The crowning of calender rolls is a problem presenting factors of unexpected difficulty; at first sight it appears evident that all we have to take into account is the load on the lower roll. To correct for the effect of this, all that apparently should be necessary would be to give enough crown to overcome the deflection due to this load. The load on the bottom calender roll, due to the weight of the rolls, only may be 75 tons, on a modern high speed news machine, and this is quite an item to take care of in itself. There is, however, another factor of even more importance, which is possibly better illustrated by a description and sketch of an actual case, in order to point the moral of explanation, than could be shown in any other way.

The three views in the illustration show—

(1) The side diagram, indicating the strains and deflections set up when running;

(2) The appearance of the two bottom rolls of the stack when set up complete, but not running. This view is exaggerated in order to show that the crowning is apparently excessive, the rolls bearing hard in the middle and not touching at the ends, in fact, light could be seen at the ends between the bottom and the so-called lower intermediate roll. These rolls were 160 inch face, and should have apparently, owing to the high pressure in the middle, given "soft" rolls on the winder or reel in the middle;

(3) This view shows in exaggerated form the apparent relationship of these two lower rolls when in operation; the rolls of paper made, as received from this stack of calenders, were hard in the middle and soft at the ends, showing beyond a doubt that the crowning was not sufficient.

A glance at view (1) explains the cause of the apparently anomalous fact, showing as it does, that the weight and the movement of the calender rolls, both tend to squeeze out the lower intermediate roll towards the reel, in the middle where the diameter is greatest; this action is evidently enough to make it imperative to consider these new applications of force to the problem of crowning, when the crown is being calculated.

In conclusion, it is well to note that in no place in the paper machine, would the use of a successful design of a non-deflectible roll give better and more worthy service than in the stack of calenders, unless, indeed, it were in the winder itself.

A report of the New Brunswick Government says that the income from the lands annually is \$795,750. According to present millage dues and stumpage the land is sold by the operators annually, and this is subject to and under such regulations as will prevent the cutting there of small trees and saplings, and the rapid increase in the value of the leases and the income has enabled to make a complete survey of the forest wealth.

SALE OF OCEAN FALLS CO. PLANT CONFIRMED.

The contract entered into between the Western Canada Trust Company, as receiver for the debenture holders of the Ocean Falls Company, and Messrs. Fleishacker Brothers and Johnston, of San Francisco, whereby the plant of the Ocean Falls Company, situated 200 miles north of Vancouver, is to pass under the control of a merger of Pacific coast pulp and paper interests, has been confirmed by Justice Morrison of the Supreme Court.

The contract has been unanimously endorsed by shareholders at a meeting called in London, Eng., and provides that the creditors shall be paid by the interests which the taking over the plant and assuming the liability toward debenture holders. The plant at Ocean Falls is one of the largest pulp plants on the coast, and is equipped with modern machinery for turning out 140 tons of dry pulp per day. A lumber mill has been in active operation for some time in connection with the company, but the largest aspect of the company's enterprise was the pulp industry.

Financial difficulties arose before the plant was completed, with the result that control passed to the debenture holders in England, who had contributed \$3,500,000 towards the company's capital. At the recent auction held in Vancouver, the court placed a reserve price of \$3,375,000 on the plant, which includes 80,000 acres of pulp and timber leases, extensive water powers, a fleet of tug boats and launches, a townsite with a large hotel, residences, workmen's dwellings and a school house, in addition to a pulp mill and a lumber mill.

THE CHICOUTIMI PULP CO.'S ISSUE

(From Our London Correspondent).

Some weeks ago I drew attention in these notes to the fact that Mr. J. E. A. Dubuc, Managing Director of the Chicoutimi Pulp Company, was in London and that Canadians would be likely to hear something of interest very shortly. That item of interest has now come. As a matter of fact, Mr. Dubuc has been visiting Mr. F. E. R. Becker and Mr. Faithful Begg (chairman of the London Chamber of Commerce) regarding the raising of \$1,200,000 in shares of \$100 each for the purpose of acquiring the freehold rights of the pulp wood lands situate in one continuous block on the Peribonka and Manouan rivers in Quebec, so that the Chicoutimi Pulp Company may have a constant supply of timber and do away with the question of stumpage, which has lately been raised to an enormous sum. The investment is a sound one, and there is not the slightest doubt about the Chicoutimi Pulp Company being a well paying and prosperous concern. The Company have been so wide awake that while others were sleeping they secured with several firms in England contracts for pulp to cover ten years' supply, and the prices are reckoned to be top ones. The new company will be known as the Chicoutimi Freehold Estates, Ltd. Mr. Faithful Begg, a well-known London financier, is chairman, and the other directors are Mr. Colin McCuaig, of Montreal, and Mr. Dubuc. Mr. F. Becker, of London, the well-known pulp importer, and one or two others, buys on an average 86,000 tons of pulp from the Chicoutimi Company, out of an estimated production of 90,000 tons, so that it is necessary to study the question of pulp wood lands without delay.

PAPER TESTING AT THE U.S. BUREAU OF STANDARDS

By **FRED C. CLARK**, Director of Paper Laboratory, Bureau of Standards, United States.

The term quality, when applied to any manufactured article depends upon three important considerations, viz., Materials used; methods of manufacture, and suitability of the finished product for a particular purpose. There is a constantly growing demand on the part of the large consumer for reliable means by which he may determine quality, as it applies to the materials or articles which he purchases. The value of the testing of materials has become a recognized fact, and the knowledge thus gained is being utilized by the manufacturer as well as the consumer.

The paper industry has been somewhat slow to recognize the value of methods of testing, due in large part to the diversity of raw material that may enter into the composition of paper, and also due in part to the tremendous growth of the industry. When it is considered that this country produced less than 50 tons per day in the year 1880, while the year 1913 shows a daily production of 18,000 tons, we may realize something of the tremendous demand for paper by the country at large; and considering the demand it may be readily understood why manufacturers have not given more attention to the testing of their raw materials or their finished product. The realization of the value of accurate knowledge relating to quality in paper, has, therefore, come first from the large consumer, rather than the manufacturer, due largely to the fact that the large buyer was required to have an intimate knowledge of many kinds of paper, while the average manufacturer need only be familiar with his own product.

Determining Paper Standards.

The United States Government, in point of total value and diversity of commercial grades used is one of the largest consumers of paper in this country, and was one of the first consumers in this country to recognize the value of definite requirements for a particular use. The day of trade terms to represent a certain definite grade of paper is almost a thing of the past in this country. For example, you may purchase "bond" paper made from all chemical wood, all high grade pines, or any grade in between; the same thing holds true of many other trade papers. The question is asked at once: what is the difference, if any, and how may true of many other trade papers. The question is asked at once: what is the difference, if any, and how may this be determined? If rag stock has any advantage over chemical wood in a bond or ledger paper, then it must be worth while to have some means to determine the fibre composition in a paper. The knowledge as to fibre composition of a paper then must have some influence in regard to the quality of a paper. The term quality as applied to paper refers to its physical and chemical characteristics, which if stated in numerical values must give a ready means by which two papers may be compared.

Matching a Sample.

The Bureau of Standards is intensely interested in this whole subject of definite specifications and mater-

ial testing. New testing devices and methods are being continually sought after and co-operative work is being undertaken with both manufacturers and other laboratories. The fact is coming to our attention more strongly all the time that the manufacturer who has an accurate knowledge as to his product is in a much stronger position for competition than is the manufacturer who gives little or no attention to this detail. For the same reason the manufacturer who has an accurate knowledge as to his competitor's product, or the needs of a new customer, is in much the stronger position than is that manufacturer who relies on "matching a sample" without full definite knowledge as to the particular requirements the paper must have.

A countless number of cases may be cited in which a paper buyer after several trials of different lots of paper will decide that a certain paper will meet his special needs. This particular paper he calls by a special name and then he attempts to get reasonable bids on a specification in which he has incorporated a large number of meaningless terms. A point in mind is where a manufacturer was sent a sample of very ordinary all wood machine finish printing, and was asked to bid on several pounds of one size and weight, the customer stating that the enclosed sample was an extra superfine, lithograph paper and was required to be without stretch or shrinkage in either direction and no wood pulp would be permitted. He also stated that the enclosed sample was satisfactory in every particular. Did he get the paper? he certainly did and he paid eight and one-half cents per pound, because four cents represented the cost of a special name, as he could have bought machine finish printing for under 4½ cents. But what about the unsuccessful bidder, who not having seen the sample put in a bid at 10 cents per pound with the intention of supplying an all-rag paper, which he knows from previous experience in the manufacturing of lithograph papers gives excellent results for fine lithographic printing. This is a case in which a simple definite specification could easily have been drawn up and as has been proven in later deliveries the price has been very materially reduced by the use of such a specification. This illustration is only a representative one of a great many cases that could be cited.

Qualities and Properties.

In this discussion of paper testing, it should be distinctly understood that the numerical values obtained as the result of physical and chemical tests upon a given sample do not cover every quality or property a paper may have. Such important properties as "color," "finish," "formation," "degree of sizing," "dirt," "rattle," and the "feel" of a paper are terms often used, and in fact it would be practically impossible to describe any paper without using one or more of these terms, yet so far no tests have been developed which will enable the testing laboratory to express these properties in numerical terms. There are no definite standards with which a paper may be compared to determine these special properties, for a set of standards that would be suitable for one class of

*From the Paper Trade Journal, New York.

papers, would be absolutely unsuitable for use in grading, and, in fact, any other class of papers.

The accurate testing of a sheet of paper then narrows itself down to determining those properties which may be expressed in numerical terms. These values are such that when due care is exercised two or more individuals using the same methods and samples, and working independently will obtain duplicate results. By such methods the personal element of the individual is very largely eliminated.

Paper Testing.

Paper testing may be divided into three heads as follows:

- Microscopical examination.
- Physical testing.
- Chemical analysis.

By a microscopical examination the kind or kinds of fibres entering into the composition of a paper may be determined and the experienced individual will, with considerable accuracy, be enabled to estimate the proportion of the various fibres used. The microscope also indicates the presence of rosin size, the kind of loading material used, and the effect of the beating process on the fibres. The microscope could also be made to serve a most useful purpose to the manufacturer in helping to identify specks and dirt spots.

Physical testing includes those properties such as weight on the ream basis or per unit area, thickness of the individual sheet or the "bulk" of a certain number of sheets, bursting strength per unit area, tensile strength per unit width or per square inch of cross sectional area, elongation at rupture, folding endurance change in area due to variation in atmosphere humidity and the absorption of moisture in definite time intervals.

Chemical analysis shows the kind and amount of "sizing" and the "loading" material retained and the nature of the coloring materials used.

Microscopical Examination.

The principal purpose of a microscopical examination is to determine what fibre or fibres were used in making a paper, and then to estimate the relative proportion of each on a basis of 100 per cent for the total fibre composition. Such an examination requires the following apparatus: Beakers, test tubes, slides for microscope, two long pointed steel dissecting needles, Bunsen burner, and tripod stand (or other means of heating sample), one large bottle of $\frac{1}{2}$ per cent solution of caustic soda, one small bottle of 25 per cent hydrochloric acid, six small dark colored glass bottles with dropping stoppers for stains, small pieces of filter paper, and a microscope which for ordinary work should be capable of magnifying about 45 times. The binocular microscope will be found to be best suited for estimating work. Where it is desired to study the markings and special characteristics of a fibre then a microscope capable of magnifying 150 to 200 times should be used.

All vegetable fibres are highly transparent and cannot be easily colored when seen under the microscope. It is only necessary to use some staining solution to color the fibres in order to bring out their size and shape and general characters. The best stain for this purpose is the so-called "Herzberg" stain, which is used to render the cellulose fibres blue, that is, it has the property of giving a blue color to most uncolored fibres, except the chemical wood pulps

are colored an indigo blue; cotton, linen, and some other fibres are colored a wine red.

This staining solution is made up as follows:

- Solution "A"—20 gms. Zinc Chloride.
10 cc. of water (preferably distilled).
- Solution "B"—T.1. grms of Potassium Iodide.
0.1 gram of Iodine crystals.
5 cc. of water (preferably distilled).

Dissolve "A" by adding the water to the zinc chloride in a glass beaker. Dissolve "B" by adding a few drops of the water to the potassium iodide and iodine crystals in a glass beaker, and after dissolving add the remainder of the 5 cc. of water. The two solutions—"A" and "B"—are then mixed together and allowed to stand 24 hours to settle, after which the clear liquid may be poured off and divided between two of the dark glass bottles with the dropping stoppers. All iodine solutions will fade in light, and should, therefore, be kept in the dark as much as possible.

It is a very good plan to use two more of the dropper stopped bottles to keep a concentrated solution of zinc chloride and water in one and a concentrated solution of potassium iodide and iodine in water in the second; these two solutions will be found convenient in adjusting the Herzberg stain.

How to Make a Microscope Test.

The preparation of a sample of paper for the microscope is as follows:—Several small pieces of paper of about the area of a cent are cut from different parts of a sheet of paper. These pieces are then placed in a beaker and covered with some $\frac{1}{2}$ per cent solution of caustic soda, and the whole mass is then brought to a boil over a suitable heating device. After boiling for about a minute, the liquid is poured off and some tap water added to wash out the caustic soda, and two or three drops of a 25 per cent solution hydrochloric acid added to neutralize the alkali.

The slightly acid solution is then poured off and enough of the small pieces of paper are pinched off and rolled into a ball of about the size of a pea. This small ball of pulp should be well rolled between the thumb and finger, and then placed in a test tube, and the test tube about half filled with water. Care must be exercised to rinse the hands after working each sample, to keep from contaminating the sample following. The test tube is then shaken vigorously, until the paper has been entirely broken up and the fibres are well separated. A few fibres are next removed with the point of the microscope needle from the test tube, and a small sample is placed on each end of the microscope slide. The slide should be held in the holder over some black surface, as it is a great help to the eye to look at white fibres against a black background. The wet fibres on a slide may best be dried by covering them with good filter paper and left to dry for a few minutes in the air.

The fibres are thoroughly dried and a drop of the Herzberg stained is added, and the fibres are well "teased" out by the use of two microscope needles, a cover glass is placed upon the fibres and well pressed down, all the stain pressed out around the edges of the glass being removed with filter paper, and the slide polished with paper or cloth.

The slide is next placed under the microscope and after studying the various fields, an estimate of the proportion of each of the various kinds of fibre may be given.

It is best to use four stains for this work, that is,

each stain is of slightly different strength as each one gives the best results on certain fibres. For example: a stain that clearly brings out the wine red color on cotton and linen fabrics, as a rule usually does not give the best blue color on bleached soda and sulphite pulp; this same stain on ground wood pulp has almost no effect at all.

In making up a stain to produce the best color on the particular fibre, the following points should be remembered:

Two or three drops of water added to a good stain for rag and bleached chemical wood will tend to fade out the wine-red color, the blue will remain nearly unchanged, and the yellow color on ground wood will be brought out very much clearer. In other words, a good rag stain when used on ground wood, produces produce a deeper blue on chemical wood fibres.

The addition of two or three drops from the bottle containing the concentrated solution of iodine and potassium iodide in water, will produce a deeper wine-red on rag fibres, while the addition of a few drops of concentrated solution of zinc-chloride in water will produce a deeper blue on chemical wood fibres.

It should be remembered that these iodine solutions will continually fade out and that the best results may only be obtained when the stains give the proper colors.

The easiest and best way to secure a stain of the right coloring capacity is to keep on hand the following pulps: Bleached soda and sulphite pulps, unbleached sulphite, ground wood and beaten rag stock. The rag stock may most easily be secured by using a sheet of good quality filter paper, which is always made from "all-rag" stock. Now take small bits of the bleached soda and bleached sulphite pulps and thoroughly mix them, after first separating them in water in a test tube. Place a small sample on a microscope slide, thoroughly dry the fibres, add one drop of stain, separate fibres with the needles, place cover glass in position and place slide under the microscope. Each fibre seen should be of a blue color, the sulphite fibres appearing much wider and longer than soda fibres, and should show a lighter blue color, as the fibre is more translucent than a soda fibre, while the soda fibre should take a darker blue color.

Soda and sulphite fibres should show a slight color difference, the soda fibres being colored a darker indigo blue, while sulphite fibres should be colored a lighter indigo blue. If this color difference is not clearly brought out, then either water or zinc chloride solution should be added, depending whether it is desired to weaken or deepen the colors.

Some rag fibres should now be added to the test tube, and a second slide made up, using a bottle of stain which is intended to produce best results on mixtures of rag and wood pulps. This second stain is adjusted by adding water, zinc chloride, or iodine-potassium-iodide, or all as may be needed until the three fibres, soda, sulphite, and rag, are all clearly brought out.

A third stain should be prepared for such papers as contain ground wood by using a mixture of ground wood and sulphite (unbleached) and then adjusting the stains to give the best colors. The proper color for ground wood is the lemon-yellow, never an orange-yellow, as then the sulphite pulp is too slightly colored and ground wood estimates are necessarily too high.

The experienced man may by using this method give some very surprising results. The Bureau of Standards believes that in papers containing mixtures of

rag and bleached chemical wood, a careful microscopic estimate is well within 5 per cent of the correct fibre contents. For papers containing ground wood, especially where the percentage of ground wood is high, then the degree of accuracy is within 10 per cent of the correct fibre contents.

Physical Testing.

For laboratory use the quickest sheet-weighing device is the quadrant paper scale, so graduated that the corresponding ream weight—either 500 or 480 sheets—is read off directly in pounds.

Thickness of paper may best be determined by the use of a spring micrometer having a hand that travels around the circular dial. This dial is graduated into thousandths of an inch and may be read to ten thousandths.

Care should be taken to see that the pressure on the paper is constant, and also that the pressure surfaces are large enough not to compress the paper.

The bursting strength of a paper is determined with a machine by which the paper is firmly clamped against a rubber diaphragm through which the pressure is applied to a circular area of the paper measuring one square inch. The actual pressure of the liquid under the rubber diaphragm required to burst the paper is registered on a carefully calibrated pressure gauge, reading pounds per square inch. An average of ten readings is taken as the correct bursting strength.

The tensile strength of a paper is determined upon a suitable machine, capable of accurately recording the tension required to break a strip of paper, when held at each end by suitable clamps and the clamps are moved apart until breaking of the paper occurs.

The folding endurance is measured on a machine in which a strip of paper of definite size is clamped. The clamps are held apart under definite tension and the paper is caused to bend back and forth upon itself, until the fibres wear through at line of folding. The number of double folds is recorded automatically by a suitable device.

Expansion of a paper may be determined by submitting the paper to different atmospheric conditions and noting resultant size of sheet at each change in the atmosphere.

The measure of absorption of a paper is the height to which, in a given time, a liquid will rise by capillary action, when one end of a vertically held strip of paper is immersed in water. This test as well as all physical tests must be made under a uniform condition of humidity.

Chemical Analysis.

An ash determination is made by igniting a two gram sample in a porcelain crucible until residue contains no carbon. The crucible is allowed to cool in a desiccator and then weighed and the weight of the ash divided by two and multiplied by 100 gives the per cent of ash retained in the paper. This result includes the per cent natural ash of the fibres plus the per cent actual loading material retained. The character of the loading material may be determined from the ash by either chemical methods or by the use of the microscope.

Quantitative Determination for Rosin and Glue.

The quantitative determination for rosin is made as follows: A five gram sample is cut into strips and the strips folded back and forth upon itself, and then

placed in a 500-cc. Erlenmeyer flask. The paper is extracted with alcohol made acid with acetic acid.

The extract is next transferred to a casserole and after evaporating off the alcohol, the acid residue is taken up in water and extracted with ether in a separatory funnel. Three extractions are sufficient, and the combined ether extracts are washed twice with water and transferred to a weighted dish. After evaporation to dryness the residue is evaporated with absolute alcohol to remove water and heated in an air bath at 90 degs. C. for one hour.

The dish is then allowed to cool in a desiccator and weighed. The resultant weight in grams divided by 5 and multiplied by 100 gives the per cent total rosins.

One of the simplest tests for the presence of rosin sizing is to place a drop of ether on the paper. The presence of rosin sizing will be indicated by the formation of a ring around the edge of the spot after the ether has evaporated.

A quantitative determination for glue may be made by extracting a sample of the paper with warm water and precipitating the glue with tannic acid or phosphomolybdic acid. The precipitate that forms is an indication of glue in the paper.

Glue may be determined quantitatively from the nitrogen factor, by the well-known Kjeldahl method.

Causes of Rejections.

In regard to the acceptance and rejections of paper by the Government Printing Office, it will no doubt be of considerable interest to the entire trade to mention some of the causes for the rejection as well as what point seems to cause most trouble to the government contractor. The deliveries so far for the present contract year show that approximately 87 per cent of all the paper delivered to the Government Printing Office was found to "Conform to the standard samples and specifications in every particular." Of the 13 per cent which was rejected, over 36 per cent of this total was rejected on account of color, finish and formation, and of these three, color seems to be much the greatest cause for rejection. The requirements that appears to be the second hardest to meet was bursting strength. In this case 17 per cent of the total number of rejected papers was rejected due to papers being below requirements. An excess of rosin size was responsible for 2 per cent of the total rejections, while an excess of ash and a deficiency in fibre composition was responsible for 5 per cent and 9 per cent rejections respectively.

A number of rejections were such as could only be classed as carelessness on the part of the manufacturer. This is meant such things as failure to watermark when so ordered and where the specification definitely calls for watermarking with the great seal of the United States. Rejections were also made in certain lots that were received with the great seal watermark, yet no watermark was required and a watermark of any kind made the paper absolutely unsuited for its particular purpose. Careless wrapping and packing, in some several inches too large, so that the paper slid around in the case and was badly damaged in transit, was also the cause of several rejections.

There are two long lists of causes of rejection the Bureau has prepared it points for the attention of the trade as to color and bursting strength, for on these two points the Government Paper Office has the most to say. The first list is that finish, formation, and color are the most important, but that the paper maker

succeeds in these requirements more often than in the matter of color and strength.

It is a well-recognized fact that a bursting strength requirement for papers is not considered by the paper trade as one of the more important points. For this reason the bursting strength requirement in the Government Printing Office schedule and other government schedules for paper supplies has been looked upon with disfavor by the paper trade. To some the impression has been gained that the addition of a bursting strength requirement was an attempt to impose a hardship on a contractor. In regard to this point, I wish to give special emphasis to the fact that more time and attention has been given to this one part in the specification than has been given to any other. And the minimum limit has been established only after a long series of test on actual deliveries. The records of tests on deliveries for the past two years show results that fully justifies the requirements adopted, as only in very few cases has it seemed advisable to change the specification requirement.

For the convenience of the Paper Laboratory, the ratio of bursting strength to ream weight has been calculated on the 25 x 40 size, and the resultant figure is expressed in per cent. For example, lots 50 to 53 inclusive—white tablet writing, all wood, is required to have a minimum of 17 points on a 48-pound 25 x 40 size; this gives the ratio 35.4 per cent. With this ratio the required minimum bursting strength for any other weight under this item may be readily found by multiplying the ream weight on 25 x 40 by the ratio 35.4 per cent, and the result is bursting strength required. Lots 56 to 62 inclusive—50 per cent rag writing, machine-dried and supercalendered, is required to have a ratio of 36.7 per cent, equal to 1.1 points per pound on a size 16 x 21 inches. Lots 63 to 88 inclusive—75 per cent rag writing, tub-sized and air or loft-dried, the ratio is 58.5 per cent, equal to approximately 13½ points bursting strength per pound on a ream 16 x 21 inches. Lots 94 and 95—thin bond, highest grade, must have a ratio of 76.7 per cent, equal to 2.3 points bursting strength per pound on a ream 16 x 21 inches. Lots 96 to 99—bond, all rag, the ratio is 74.2 per cent, equal to 2¼ bursting strength per pound on a ream 16 x 21 inches. Lot 100—Highest grade bond—the ratio is 83.4 per cent, equal to 2½ points bursting strength per pound on a ream 16 x 21 inches. Second-class ledger is required to have a ratio of 58 per cent, equal to approximately 13½ points per pound, 16 x 21 inches, and first-class ledger has a ratio of 85 per cent, equal to approximately 2½ points bursting strength per pound, 16 x 21 inches.

Uniform Testing Methods.

It is the firm belief of the Bureau of Standards that all manufacturers and users of paper will readily recognize that a correct set of definite chemical and physical tests when carried out under uniform conditions, will give more reliable results than could be obtained in any other way. It is also the belief of the Bureau of Standards that a knowledge as to the nature of our methods of paper testing as well as the manner in which a paper specification is developed, will tend to convince the trade of the fairness with which this work is carried on.

It is not meant that a set of tests will tell all about a paper, but that a set of definite tests, together with a judicious exercise of judgment in regard to color, finish, formation and dirt, will tend to promote fairness to all

concerned. The government fully recognizes the fact that whenever a paper specification imposes a hardship or restriction upon bidders in an unnecessary manner, that same restriction will necessarily tend to raise the price of that particular grade to the government.

It is the belief of the Bureau of Standards that only by earnest co-operation between the government testing laboratories and the manufacturers may the most desirable paper specification be developed. The greatest degree of co-operation will come when manufacturers understand that their comments or criticism on any point will be given the fullest consideration by the Bureau of Standards. Such discussions invariably develop much valuable data, and the results are beneficial to all concerned.

Summary of Court Decision in Spanish River Case

As announced in the last issue of the Pulp and Paper Magazine, the Customs Court of the United States reversed the decision of the Board of General Appraisers which allowed the free entry of paper manufactured by the Spanish River Pulp and Paper Co. from pulp wood grown on Crown Lands of Ontario upon which the Government had removed the Provincial restrictions in favor of the owner. The Customs Court in summing up the issues under consideration, says:—

"On the 25th day of November, 1912, the importer was the owner, subject to the conditions and provisos contained in the written instruments relating thereto, of certain concessions or grants of the right to cut pulp wood and other wood upon large tracts of Crown lands in the Province of Ontario for a period of substantially twenty-one years, which has not as yet expired. The enjoyment of these concessions by the importer was upon the condition, among other things, that it should establish and equip in Canada pulp and paper mills at an expense of at least \$1,500,000 (and which appear in fact to have required an outlay of upward of \$3,000,000), and that it should continuously maintain and operate the same to the extent of producing annually at least 35,000 tons of pulp and paper, and that it should employ on an average 400 hands in connection therewith. The concessions prohibited the importer from cutting wood on the lands covered thereby for the purpose of exporting the same in the wood and from selling the same to other persons for export in that condition."

The Spanish River Mills protested to the Canadian Government that under its agreement it was forced to pay a duty on all of its shipments of paper to the United States, and that therefore it was unable to compete with other Canadian mills. The Minister of Crown Lands then met with the officials of the Spanish River Mill and a new agreement was drawn up, which gave to the Spanish River Company the right to export pulp wood and a general release from all Crown land restrictions, provided that the mill agreed to erect and equip two additional machines at its Espanola Mills, increase its production from 35,000 tons of pulp and paper a year, and to employ at least 1,000

hands in the woods. This the Spanish River Mill agreed to do, and Judge Barber, of the Customs Court, commenting on this agreement, says:

"It is manifest that the installing of the additional machines, the employment of the additional help, and the production of the increased output are all new conditions to be performed by the importer in order that he may enjoy the right to export, and is a continuing consideration therefore.

"A restriction means a restraint, a limitation, a confinement within certain limits, and one can hardly refrain from querying if it was intended by the contract of November 25 to remove all restrictions upon exportation, why it was not stated in simple language in substance that the Spanish River Pulp and Paper Mills, Limited, was thereby unconditionally relieved and released from the prohibition of export in the earlier contracts provided, notwithstanding anything therein contained to the contrary. This would have left the company entirely free to cut and export pulp wood if it so desired without compelling it to return, yield or pay any consideration therefor, and would have clearly accomplished what it is urged was accomplished. The importer could then have exported all or any part of the pulp wood cut by it upon crown lands without incurring any liability to have its rights under various grants terminated by reason thereof. In other words, its right to export would have been wholly free and unrestricted.

"But the parties instead of this elected to contract that certain conditions, some new, some old, and all to be observed and performed by the importer, should be the consideration for the abrogation of the prohibition of export and of the grant of the right thereof.

"It follows, therefore, that whether these importations are a part of the required annual product of 50,000 tons or are a part of an excess thereof (the evidence is silent on this question), they are not entitled to free entry as claimed, because the importer has not an unrestricted right to export pulp wood from which they are manufactured.

"The conclusion we reach is really giving effect to the intent of the parties of the contract, because on one hand the importers object in executing it was to obtain so far as it might the naked right of export without intending to exercise it to any substantial degree, but for the purpose of enabling it more successfully to compete with other Canadian manufacturers; on the other hand, the Government's intent was to see to it that but little pulp wood was exported as a consequence of its being entered into, and to make certain this result the Government by the contract armed itself with, or rather, expressly reserved to itself the right, from time to time and for any cause appearing to it to be sufficient, or by order in council, to make regulations and impose restrictions not only upon the exportation of pulp wood, but of any other wood or timber cut on said concession land.

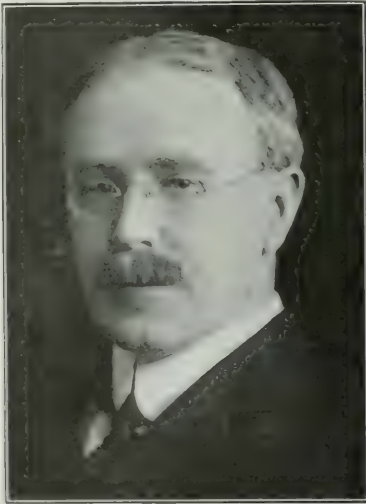
"We are all impressed with the view that the effect of the contract in question was to clothe the importer with the nominal but not the real right of unrestricted export of pulp wood, and that the construction thereof claimed by the importer would result in an evasion of our statute, which is designed to prevent restriction of every kind of export of pulp wood from Canada and its provinces, and gives free entry only to pulp wood and certain of its products when the wood is entitled to unrestricted export. We are unwilling to either adopt such a construction or assent to such a result."

Who's Who in the Canadian Paper Industry

T. J. Stevenson, Sales Manager, Riordan Pulp and Paper Company.

By W. A. CRAIK.

If Morse had not invented the telegraph, it is quite within the possibilities that T. J. Stevenson might never have entered the pulp and paper manufacturing industry, but might have drifted into some other occupation less suited to his particular capacity. The way of it was this: As a boy he had mastered the mystery of key and sounder in the local office of the Montreal Telegraph Co., at Kincardine, Ont., where his family were living at the time. Presumably he intended to make it his calling in life, but fortunately for him fate whisked him off to Merriton and at Merriton his familiarity with the instrument was the means of intro-



ducing him for the first time into the inside of a paper mill.

The Riordan mill at Merriton sported a wire over which the office sent and received messages, made connections, and generally kept in touch with the paper market, and it was to operate this wire that young Stevenson was engaged thirty-four years ago. The particular work of sending messages did not consume much time, and in the intervals he was employed as a regular clerk in the office. Being a bright youth and trusting himself capable, he got along rapidly, and ere long, some after he had entered the mill in a junior capacity, he had risen to be its manager.

Mr. Stevenson hails from Welland County, Ontario, where he was born within sound of Niagara Falls. His father was engaged in the contracting business under John Brown, of Thorold, and being employed in various government jobs, which necessitated his moving about from place to place, his son led a varied existence as a boy. The family resided at one time or another at Cobham, Georgetown, Kincardine and Thorold, and Mr. Stevenson had a taste of schooling in all these

places. Whether these frequent changes of scene had anything to do with the development of a most versatile and agreeable character, is open to debate.

With the Riordan Company the ex-telegraph operator has made solidly good and is to-day one of the strong men of the organization. On the completion of the company's Hawkesbury mill he was transferred from Merriton to the new property and remained there as manager for five years. In the interval the general business of the company had grown to such an extent that the appointment of a regular sales and traffic manager was deemed necessary and the choice of the management fell on the energetic superintendent of the Hawkesbury plant. He was brought back to Merriton, where he commenced his new labors, and later was transferred to the head office in Montreal, his present headquarters.

The Riordan Company, as is generally known, were the pioneers in the manufacture of sulphite chemical pulp in Canada, and to-day an important department of their activities is the supplying to paper manufacturers all over North America of this basic product. The duties which Mr. Stevenson performs in superintending this sale are of the most onerous description. It necessitates a great deal of travelling throughout the United States and Canada, besides a close attention to trade conditions, particularly relating to tariff. During the reciprocity negotiations and subsequently, when the United States tariff was under revision, he had his hands full in looking after the interests not alone of his own company, but of the Canadian pulp and paper trade in general. In this work he has proved himself to be a born diplomat and the trade owes a great deal to his skilful handling of a very difficult situation.

"My belief is," declares Mr. Stevenson, "that what is good for the business of a country is likely to be best for the country's general interests. That is why I have always been a staunch Conservative, because I am convinced that a policy of protection is the best thing for Canada."

During his connection with the Riordan Pulp and Paper Co., Mr. Stevenson has seen that company's operations expand enormously. When he first entered their employ the mill at Merriton was producing about ten tons of news and wrapping paper per day. Compared with present production this seems small, but in 1880 it was the largest output of any Canadian mill. To-day the Riordan Company does a business of 50,000 tons per annum, the largest of its kind in the British Empire. The share which Mr. Stevenson has taken in bringing about this result has been by no means small.

Affability is an outstanding Stevensonian characteristic. He does not hedge himself around with a wall of self-importance nor manage his office on formal lines. He is approachable at all times, frank and open in manner, and with something of Pickwickian benevolence shining from his eyes. His smile is contagious. It draws up his face into wrinkles, closes his eyes behind their glasses and makes his whole countenance merry. Small wonder is it that everyone speaks well of T. J. Stevenson and is glad to call him a friend.

He belongs to the old school of business men whose loyalty to the company for which he works transcends all other interests. He has given thirty four years to the service of the Riordan Company and he does not grudge a day of it. He is careful, conscientious and a hard worker, deriving his greatest satisfaction in seeing the business prosper under his guidance. His duties require a world wide familiarity with conditions in the

trade, and few men in Canada have a broader grasp of the situation than he.

Mr. Stevenson's choicest diversion is to go on a fishing expedition. He belongs to several clubs of anglers and delights in getting out into the woods in spring-time and whipping the brooks for trout. Of more formal sports his favorite recreation used to be lawn-bowling, which he pursued with considerable zest when he was living in Meriton. This he has had to give up since he went to Montreal. His chief intellectual pleasure has been derived from his Masonic work. He has risen to high rank and is a most loyal Mason, sacrificing a great deal of his time to the interests of the Order.

He is a first cousin of Eliot G. Stevenson, the noted Detroit lawyer, now head of the Independent Order of Foresters. The relationship is a doubly intimate one, for both men's fathers were brothers and their mothers sisters. T. J. Stevenson resembles his cousin somewhat in appearance and possesses a good many of his characteristics. He has one son, who, after a course at Ridley College and McGill University, is now going in for a business career in Montreal.

In bringing about the recent organization of the Canadian Pulp and Paper Association Mr. Stevenson was one of the most active members of the trade, and he has subsequently given most loyal support to its work. He is now chairman of the Chemical Section.

Leather Board

Genuine Leatherboard, in other words board made from real leather scraps is made as follows:

According to a tried-out system the leather scraps consisting of old belting, shoes, etc., are first cleaned by hand, sorting out all foreign matter such as nails, wood, strings, etc.—Next the scraps are sorted as to color in three piles, i.e., blacks, mediums, and whites.

A Ragcutter of strong and heavy construction—sometimes a rope-cutter is employed—reduces the leather scraps to palm-sized pieces. In case such cutting machinery is not available the leather scraps can be cut by hand with a hatchet or a knife on wooden blocks, however, care must be taken that no wood splinters get into the leather. These small pieces are then put into old jute bags or wicker baskets and soaked in water—a nearby river or pond—for a period of 10 to 14 days.

The water has a different influence on each of the three kinds of leather. The blacks will float during the entire time of the soaking, absorbing but little water, the softer mediums absorb the water very readily and soon sink to the bottom, their volume increasing greatly, finally the white leather will float a few days before settling down.

During this soaking process various coloring of the water will be experienced, which is due to the different kinds of tanning the leather. Thus the white leather will give a greenish-yellow tone, the black leather will produce a light brown coloring, while the mediums will turn the water dark brown. Such prolonged soaking will remove all impurities such as oil, grease, paint, etc., besides it tends to loosen up the fibres, thus aiding in the disintegrating of the material.

The water-soaked leather is then transferred into a vat, excessive water being allowed to drip off. In case the leather still seems to be too dirty and somewhat stiff a solution of 15 kilos lime and 5 kilos soda to

each 100 kilos of leather is poured over same. Should the leather be soft and fairly clean either the lime or the soda solution will be used. The scraps must be entirely covered. The leye will be permitted to work for a period of from 24 to 36 hours, after which same will be run off. Warm water is used for washing purposes, this being done either in the same vat or in a wash-hollander until the wash water remains clear.

The leye will destroy some of the leather color, however, this is of no importance in the ensuing process. Through heating the leye with steam up to a temperature of 20 deg Cent., the leather will readily become softened. A higher temperature than 20 deg. Cent., will convert a considerable amount of the leather into glutinous matter, consequently such excessive heating must be avoided.

The leather scraps are now ready for the beater. This process takes considerable time, i.e., 8 to 10 hours. Since the stuff shows a tendency to settle down it is necessary to keep it well stirred up. The work of the beater will produce a rather fine stuff which, when diluted in water will show no real fibres like ordinary paper stuff, but a granulated appearance with an occasional baggy enlargement. The latter represent parts not fully disintegrated by the beater. The typical absence of any fibres is due to the leye treatment.

Inasmuch as the leather itself contains enough of glutinous matter there is no need of sizing the stuff. Likewise no mineral filler is used nor any coloring done. As soon as the stuff is beaten enough it is run into the machine chest. Owing to the nature of the stuff the wire will easily become dirty, and a continuous cleaning with high pressure water showers is imperative. Furthermore the stuff shows quite a tendency to adhere to the wet-felts, consequently only such with as little nap as possible ought to be used. The felts must be kept rather wet especially when starting the machine. With very evenly adjusted presses the couching must not be excessive. The stuff being rather "slow" will retain the water to quite an extent, very little draining through the wire, consequently a moderate speed must be employed. In order to ensure a quicker drying of the sheet it will be found advisable to slightly heat the stuff in the machine chest.

The boards as they come off the sized roll will then be piled up with alternating equal sized cuts of some cotton material to be subjected to a press. After this they are ready for drying, which is done most effectively in so-called "Reform" drying channels which prevent warping.

The disagreeable qualities of the leather board can be eliminated by adding some ground wood or chemical pulp. The beating of the ground wood or the chemical pulp will be done separately. After which same is added to the leather stuff and thoroughly mixed in a mixing hollander. Through such adding of other kinds of fibre to the leather stuff a pliable and soft board will be produced, especially when soda pulp is used, likewise with a long fibre ground wood good results have been obtained.

Leather scraps being a rather cheap material, and also taking into consideration the more or less simple process of converting same into board, it ought to be remunerative to use same more extensively.

For quite a few kinds of special boards exceedingly good results are obtained. Although the loss of raw material is rather heavy, still the use of same is to be recommended on account of the cheap price.

BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

British Paper Makers' Association

ANNUAL MEETING IN LONDON

(By Our London Representative).

The annual meeting of the Pulp Makers' Association of Great Britain and Ireland (1812, incorporated), was held in London on April 23rd. There was a small gathering of the members, over which Mr. Lewis Evans, F. S. A., presided, and, as usual, the most important business was conducted in camera, or within closed doors, so that the special features of the meeting are as secret as the grave.

The annual report stated that the Association had 126 members, and then it went on to deal with the wood pulp contract question between Scandinavia and the British Pulp Association, which is not yet settled, and reference was also made to increased railway rates in the United Kingdom, workmen's compensation insurance, statistics, and other unimportant matters of no interest to the trade in Canada. Touching on technical education, the report said: "A marked improvement was noticeable in the classes for technical education in paper-making held under the auspices of the City and Guilds of London Institute, which the Association encourages by grants, prizes, and certificates. One hundred and ninety students attended the classes, as compared with 147 in the previous session, and out of 46 candidates presenting themselves for examination, 27 passed." I simply quote the paragraph in the report to show the interest that is taken in paper making technology and to show that the British paper maker is anxious that the coming generation will have a practical as well as a technical knowledge when they will be thrown on their own resources in the industry. Canadians would do well to study this paragraph.

The President, in his opening address, said the annual report was short and business-like, and set forth most of what was done in 1913. One of the most important things before the Association was perhaps the increased railway rates. It was a matter that had been before the Council of the Association and a substantial grant had been made to one firm to aid them in fighting a legal case.

Next business was the election of officers for 1914-15 and this resulted as follows:—Lewis Evans, president; Colonel John Birrell and Joseph Dixon, vice-presidents; Herbert Green, treasurer; A. W. Foster, B. A., secretary.

As great interest is now being taken in the opening up of water-ways throughout England and old disused canals the Association had an expert in attendance to address the members on "Our neglected water-ways." The subject has been revived by the high railway charges that now prevail, and Mr. Imprey, the expert from Birmingham, said that from a few figures supplied him he formed the opinion that the tonnage carried by the members of the Paper Makers' Association in England in raw materials, coal for manufacture and finished articles would be well over three million tons per annum. So that the question was evidently one of much importance to paper makers who, along

with other trades, were suffering at the hands of the railway companies. Railway rates and charges were next discussed, after which the Association took up the mill workers' demands for a trade union label on all British-made paper and the infringement of trade customs. When these questions came up the representatives of the press were asked to retire, so we missed the tit-bit of the whole of the proceedings. The policy of this Association is to discuss as little as possible openly and publicly any question of importance and it is that policy that detracts membership and leaves the Association open for criticism. One can understand private things being discussed secretly, but to close the doors on a topic like the trade union label—particularly when people are looking to the Association for a lead on it—it seems ludicrous that no statement emanates from any member on the subject.

But while the Association adopted a strange attitude on the trade union label question, their action in regard



Mr. LEWIS EVANS, F.S.A.
President, British Paper Makers' Association

to the dinner held at the close of the annual meeting was equally inconsistent. The committee in charge decided to curtail the attendance to paper makers and their guests, the result being that, instead of 200 or 250 being present, only about 100 sat down to dinner, and from this 100 I subtract two newspaper proprietors, three newspaper reporters, and about five or six other newspaper officials, which brings the total down to about 89 paper makers and members of the allied trades. All the big wood pulp men like Fred. Becker were absent, and the whole dinner lasted a little over two hours. The Association wants new members and one would fancy that a good dinner would be the means of dragging in new blood. Lewis Evans presided also at the dinner, and the speech of the night was made by Mr. Godfree, the president of the British Wholesale Stationers, who in proposing the health of "The Paper

Trades and the Paper Makers' Association," said individual competition might be brought earlier to the notice of the wholesale stationer than it reached the paper manufacturer, but the stationer endeavored to bring it to the manufacturer's notice in as amiable a way as possible, and there was one thing to be found and that was, that British manufacture was still an important element in the paper trade not only in England, but in the colonies and other countries as well. British manufacture was an enormous asset in the paper trade and it assisted the Wholesale Stationers to a very large extent. He was one of those who was most anxious to increase prices, but he was not altogether certain that the British paper maker had been a little premature in what they had done in regard to prices. At all events, the results had been satisfactory to the manufacturer, but very troublesome to the wholesale stationers. Whatever the position might be, he was not depressed about the position or future of the British paper trade. He looked on it as one that must go on increasing every year. The demand for paper was certain to increase, just as sure as the sun will rise in the morning. He thought there should be more consultations between the stationers and the paper manufacturers, as something would be bound to arise for the benefit of both. Mr. T. Y. Nuttall responded to the toast and said he agreed with Mr. Godfree. He was inclined to think that if the energy and force put into things by the German paper trade in its exploration of foreign trade and exploitation of the resources of paper were adopted by the British paper makers and the wholesale stationers, things would be more profitable in the interests of both parties.

Mr. Joseph Dixon proposed the health of "The Allied Trades," and said he felt like the patient who consulted his medical adviser. He told of all the aches and pains and then the medical adviser, like Mr. Godfree, gave a diagnosis. Mr. Dixon then impressed on all paper makers the necessity to combine together as one man to fight, if necessary, either the coalmen or the wood-pulp men, and until they were so organized they would be perfectly useless. Mr. Fred. Bowater, brother of the Lord Mayor of London, and a member of Bowater & Sons, paper agents, replied to the toast.

Mr. W. L. Tod, one of the Scotch paper makers, proposed the health of "the President," and Mr. Evans suitably responded.

British Imports of Pulp

(From Our London Correspondent).

Statistics showing the quantities of pulp imported by the British importers and agents are now ready and the following are the principal items:—Becker & Co., Ltd., chemical pulp, 59,653 tons; mechanical, 171,285 tons; total, 230,938 tons. J. E. Salvendy & Co., Ltd., chemical, 15,001 tons; mechanical, 16,934 tons; total, 31,935 tons. W. G. Taylor & Co., Ltd., 15,003 tons of chemical and 7,060 tons of mechanical. Churchill & Sim, chemical, 16,355 tons; mechanical, 8 tons; total, 16,363 tons. Henderson, Craig & Co., Ltd., chemical, 10,471 tons; mechanical, 2,029 tons; total, 12,500 tons. Greenhalgh & Co., chemical, 10,420 tons; mechanical, 450 tons; total, 10,870 tons. Holm & Co., Ltd., chemical, 6,087 tons; mechanical, — tons; total, 6,087 tons. Friedlander & Co., chemical, 3,694 tons; mechanical, — tons; total, 3,964 tons. W. Grant & Co., chemical, 3,644 tons; mechanical, 503 tons; total, 4,147 tons. Alsing & Co., Ltd., chemical, 2,050 tons; mechanical, — tons; total, 2,050 tons. Gordon, Watts & Co., chemi-

cal, 1,317 tons; mechanical, 744 tons; total, 2,061 tons. Stora Kopparbergs Agency, Ltd., chemical, 1,398 tons; mechanical, — tons; total, 1,398 tons. R. Erikson & Co., Ltd., chemical, 656 tons; mechanical, 378 tons; total, 1,034 tons. Price & Price, chemical, 215 tons; mechanical, 1,013 tons; total, 1,228 tons. S. W. Roys & Co., chemical, 212 tons; mechanical, — tons; total, 212 tons. Camia Timber Co., Ltd., chemical, 75 tons; mechanical, — tons; total, 75 tons. T. T. McCrow, chemical, 50 tons; mechanical, — tons; total, 50 tons. Amongst the paper-makers Ed. Lloyd, Ltd., heads the list with 20,360 tons chemical and 88,654 tons mechanical, making a total of 109,014 tons. A. E. Reid & Co., Ltd., come next with 23,224 tons of chemical and 52,862 tons mechanical, a total of 76,086 tons. T. Owen & Co., Ltd., of Cardiff, are third on the list with 6,966 tons of chemical and 12,119 tons of mechanical, a total of 19,085 tons. The Imperial Paper Mills at Gravesend is next with 11,978 tons of mechanical and 500 tons of chemical.

Ottawa Notes

GOVERNMENT OWNERSHIP OF WATER POWERS.

Ottawa, Ont., May 10.— Will the Dominion Government, which has already taken an advance step by reserving all the water powers on Crown lands in Canada, go in for Government ownership of water powers?

This is the interesting question which arises as a result of some statements made by the Minister of the Interior, Hon. Dr. W. J. Roche, in Parliament last week, in regard to Western water powers, and the action of his department in reserving them instead of disposing of them to pulp and paper manufacturers. The matter was brought up by Mr. J. A. M. Aikins, of Brandon, in connection with the discussion of a new Dominion Lands Act. Mr. Aikins dealt with the exploitation of the water power resources of the West by private capital, and pointed out that the Winnipeg River alone possessed a potential horse-power of over half a million. He urged that the Dominion revenues be spent for the development of these water powers, and stated that the regulations governing their use in the West were not nearly so satisfactory as in Ontario under the Hydro-Electric Commission.

In reply, Hon. Dr. Roche stated that with regard to the Winnipeg River it was the policy of the department to conserve its waterpower although fifty per cent. of this had already been alienated. "It is a question as to whether we are prepared to go in for Government ownership of waterpowers," he said. "I do not see whether we are that far advanced; I do not think we are at the present time, but I can see the propriety of conserving these powers, and not allowing them to get into private hands for exploitation. As regards the Winnipeg River, there have been applications from private capitalists for these waterpowers with stipulations that they would erect large pulp mills on that river. But after consulting Judge Robson, the utility commissioner for Manitoba who is opposed to the alienation of any of these waterpowers, I thought it wise to carry out his recommendation."

Protective Association Formed.

The Lower Ottawa Forest Protective Association, Ltd., a new organization with headquarters in Hull, Que., has been incorporated under Quebec legislation

by timber-land and paper manufacturers from the Ottawa Valley, who desire to protect their valuable timber lands against fire. The incorporators are: Senator W. C. Edwards, W. C. Hughson, of Ottawa; J. B. White, Montreal; Robert MacLaren, Buckingham, Que.; G. H. Millen, of Hull, Qu. The association will organize an efficient fire protective system on the Gatineau, Lievre, Rouge and North Nation Rivers; supervise the timber lands owned by members of the association, and in ways legislative and educational promote their interests.

Tariff on Caustic Soda Raised.

A tariff change which will affect Canadian pulp and paper manufacturers, according to the statement of the Minister of Finance, Hon. W. T. White, in the House of Commons a week ago, is that on caustic soda when imported into Canada.

Caustic soda is a fairly large item in the manufacture of paper, and when this schedule came under discussion in Parliament, members of the Opposition desired to know whether it would affect the industry. The Minister of Finance replied that though the price of caustic soda in Canada would go up with the increased tariff in force, he did not think the effect on the pulp and paper trade would be prejudicial. Caustic soda in less than twenty-five pound packages is now dutiable at 3-10 cents per pound, instead of free, and in more than twenty-five pound packages at twenty-five, instead of fifteen per cent, when imported from the United States.

Power Bill Passed.

The bill of the W. C. Edwards Company, of Ottawa, which, as stated in a previous issue of the Pulp and Paper Magazine, was held up before the Private Bills Committee of Parliament some weeks ago, because it was considered that the increased powers which the company sought might compete with the Ontario Hydro-Electric Commission in Eastern Ontario, was finally passed last week. An amendment was inserted, however, that the rates of the company for the surplus power which they ask permission to sell, must be subject to the control of the Hydro-Electric Commission, and the bill was also altered to more adequately safeguard the rights of Quebec municipalities. "Mac."

STRAWPULP PAYS NO DUTY

According to a recent ruling of the United States Treasury Department, strawpulp is admitted free of duty under the chemical woodpulp provision. The ruling is given in the following letter to the Collector of Customs at New York:

"I have to acknowledge the receipt of your letter, transmitting a report from the appraiser and five letters from domestic paper manufacturers who are said to be users of strawpulp, from which it appears that, prior to October 3, 1913, strawpulp was regarded by paper manufacturers as a variety of chemical woodpulp.

In view of the foregoing, and as it appears that strawpulp is used for the identical purposes for which chemical woodpulp is used, you are hereby directed to treat strawpulp as if that character free of duty, under paragraph 49 of the present tariff act, which paragraph provides for the free entry of chemical woodpulp.

John Martin---A Hustler

John Martin, head of the John Martin Paper Co., Limited, who recently returned from an extended business trip to all the Eastern paper centres in Canada and the United States, reports that, while trade is rather quiet in some lines, still on the whole the outlook is favorable. Mr. Martin looks for a return to former active conditions in the course of a few months at the very least. He visits all the leading paper plants at least twice a year and keeps closely in touch with manufacturing conditions, new lines, output, etc. It is not yet four years since he embarked in business for himself in Winnipeg, starting in a very small way. To-day the John Martin Paper Co. not only has large quarters in Winnipeg but has established healthy branches in Calgary and Edmonton, while the Saskatchewan territory is being developed through sample rooms in Regina.

A man of energy and optimism, Mr. Martin is not



afraid to strike out on original lines, and one of the first moves on his part after establishing a warehouse in Edmonton was to entertain the members of the Printers' Board of Trade in that city to a banquet. He believes in the closest co-operation with the trade in all its branches. Another enterprise on his part is the publication of a house organ which deals with the problems of the printer from a wide point of view and in that way he is making the edition of interest to the Western typographical establishments. The name of the organ is "Papyrus," and the firm also handles a special brand of paper known as Martin's Papyrus.

Mr. Martin may be well styled as a graduate of the University of "Hard Knocks." His father dying when he was but two years old, left the family resources scanty, and, after a more or less varied experience, the son entered the employ of the Canadian Paper Co. at the age of seventy years. He spent two years in the

manufacturing end of the business at Windsor Mills, Que., and then came to Montreal, where he joined the city selling staff of the company. He met with such success that he was soon made Eastern representative, covering the territory that extends from Eastern Ontario to the Atlantic Coast. After serving nine years in that capacity he acquired an interest in the firm of McFarlane, Sons & Hodgson, Montreal, looking after their work in Quebec and the Maritime Provinces for seven years and being finally placed in charge of the Winnipeg branch. Some time later he launched out on his own behalf, and the expansion of the firm has been typical of Western growth and activity. His firm has such strong selling agencies as Ritchie & Ramsay, Toronto; J. R. Booth, Ottawa; St. Lawrence Paper Mills, and some of the best American lines.

Mr. Martin is well known and well thought of by all the members of the craft and is doing much to develop the paper trade on the Prairie Provinces. To build up the large wholesale paper connection which he has done in less than four years is, in the vernacular of the present day, "going some."

PAFER MANUFACTURING IN SOUTHERN BRAZIL

At the present time the manufacturing of paper has ceased in the State of Parana. Not quite a year ago there was a saw mill at Morretes, about 10 miles from Parana manufacturing wrapping paper from imported rags and wood pulp. This mill is situated right in the swamps at a point where the *Hedycheium coronarium*, a plant of a ginger character, is abundant. The *Hedycheium coronarium* reaches a height of from 3 to 6 feet, growing rather profusely, and produces from 100 to 150 stems per square meter. Many stems have a diameter of 1 to 2 inches at the root, and weigh including foliage about 100 to 600 grams. The Swedish Attache for Commerce in Brazil publishes the following two analysis made in England:

	Whole of stem plucked	Whole of stem having passed two crushing rolls
	Per cent.	Per cent.
Humidity	9.7	11.2
Ash	4.5	4.8
Cellulose	43.0	48.0
Yield of Cellulose through chemical extraction . . .	42.8	36.0
	100.0	100.0

A Brazilian living at Curitiba, holding the rights for manufacturing paper from *Hedycheium coronarium*, made the following statement: There are 7,000 to 8,000 acres of *Hedycheium coronarium* near Morretes, producing approximately 50,000 tons of dry fibre, which is sufficient for a yearly production of 30,000 tons of paper.

Early in 1914 the Anglo-Brazilian Pulp and Paper Mills Co. was founded in London with a capital of £240,000 to take over and enlarge the plant at Morretes for the purpose of manufacturing paper from *Hedycheium*. However, after careful consideration of local conditions and the value of the plant for paper manufacturing the original interest shown in this enterprise has somewhat cooled off, this report coming from a reliable and well-informed source. It remains to be seen whether actual operation of the mill will be started.

All newspaper is being imported, printers buying

direct from exporters in Hamburg and Paris without the medium of dealers at Curitiba. Only small quantities are required, a thin and cheap paper being used. One newspaper buys Austrian paper through a Hamburg jobber, while others print on Swedish, Norwegian and German paper. The Sao Paulo paper mills find a good market in Parana for wrapping paper, which is being used by the Mate (tea) exporters to line wooden barrels with. The usual terms in the paper business are 90 days sight or the acceptance of a draft payable from 3 to 6 months after receipt of goods at Parana.

PAPER MILLS IN ARGENTINA

On account of a rather high protective tariff 80c. per kilo on wrapping paper, 2c. per kilo on news, and 4c. per kilo on most of the other grades of cheap paper, Argentine paper manufacturers are in a position to make good profits.

There are 12 mills in the Argentine Republic, of which six are owned by foreigners. The total capital invested in the paper manufacturing industry is approximately \$3,500,000.00 and the yearly output amounts to some \$2,500,000.00. The figures for imports of raw material from abroad reached \$500,000.00, of which pulp and kaolin represent the biggest share.

Approximately \$150,000.00 of waste paper and rags were procured on their own markets. The amount of power employed in the industry is estimated at 4,733 h.p., divided as follows: 533 h.p. steam, 533 h.p. oil, 833 h.p. electricity. The number of mill employees is 1,405.

The most important of these enterprises are the following: "La Argentina," at Zarate. German capital, with head offices at Buenos Ayres. This mill makes chiefly wrapping papers in all shades, printing paper and cardboard, also low grades of S. C. book and litho. for the illustrated periodicals of Buenos Ayres. The daily production is about 20,000 kilos. The firm of Pablo Denti Italian capital owns two mills, one at Campana and another one at Vincent Lopez, turning out a cheap grade of printing paper. Daily production about 10,000 kilos.

SUMMER RATES ON LUMBER INCREASED

The objection made to the Railway Commission about three weeks ago by Frank Hawkins, secretary of the Canadian Lumberman's Association, acting in behalf of the lumbermen in Ottawa and district, against the proposal of the railways to increase the domestic summer rate on lumber between Ottawa and district points and Montreal from five to six cents, has been overruled by the board. This means that the increased tariff, filed to go into effect on May 4, and suspended by the board during the consideration of the application, will go into effect forthwith.

The board, however, has sustained the objection made by Mr. Hawkins against the proposed increase in the export rates on lumber from here to Montreal, from five to six cents. The judgment orders that the five-cent rate per 100-pounds, which went into effect in May, 1908, must be maintained.

In his judgment, Assistant Chief Commissioner D'Arcy Scott says that the railways have a right to ignore water competition if they desire to do so.

UNITED STATES NOTES

The White & Leonard Wholesale Paper Company, of St. Paul, Minn., has acquired 25,000 square feet of ground with Minnesota Transfer frontage. The deal was handled by the Vaughan Realty Company. The price was not disclosed. On the tract, which has a frontage of 150 feet on Pelham avenue, near University avenue, the concern will erect a five-storey reinforced concrete building to be used as a warehouse and general office. The Minneapolis branch office and the St. Paul general offices will be located in the new structure.

Financial straits brought by inability to get sufficient working capital are explained by the Capac Paper Company of Capac, Mich., in a petition for a receivership filed in the United States Court. Arthur B. Curtis, of Capac, has been appointed by Judge C. W. Sessions, of Grand Rapids, as receiver for the company, under a bond of \$75,000. According to the petition the company is only temporarily embarrassed. The claim is made that the company is solvent unless forced to liquidate on short notice, in which case its claim is that its expensive machinery, peat bogs, artificial basins and real estate would bring only a small amount of their value in connection with the business. The company is capitalized at \$1,000,000.

On May 1 the firm of Cornell & Ward, New York manufacturers and dealers in paper, with a branch factory at Kaukauna, went out of existence, having sold all their interests to retire from business. The toilet paper business, including the factories at Kaukauna and Hinsdale, N. H., were taken over on that date by the Shute-Washburne Co., incorporated, with headquarters in New York the same as before. The incorporators of the new company are men who have been with the firm of Cornell & Ward for years and who have been the managers and salesmen of the company, and continue in their respective positions with the new organization, the business in every way practically continuing as it was, only under a new name. Ross White will be the New York manager, B. B. Washburne, head salesman, Gustave F. Stohr, general office manager, and H. L. Scholl, manager of the Kaukauna plant.

Operations were started last week on the foundation of the new sulphite mill of the Penobscot Chemical Fibre Company at Great Works, Me. The mill has been planned for more than a year, but has been retarded through litigation. One hundred tons of sulphite pulp a day will be the ultimate production of the new plant, but the amount to be turned out at the completion of this portion will be about 50 tons a day. The present plant of the Penobscot Chemical Fibre Company turns out in the vicinity of 75 tons of soda ash pulp daily and the new plant will give a capacity of 125 tons of pulp of the two varieties a day.

The new superintendent who took charge of the Kierulff Paper Company plant last week was James Salter, of Middleton, Ohio. Mr. Salter received his early training in England. Most of his work there was in connection with the manufacture of jute and similar papers. Later he had several years' experience with the E. B. Felt Company at Hull, Canada. T. H. White, president of the Kierulff Paper Company, con-

siders himself fortunate in having secured the services of such a man, as his wide experience should make him a valuable acquisition. Mr. Shantly, who was formerly connected with this company, has secured a position with Robertson Brothers Company, of Hinsdale, N. H.

The John Orchard Mining & Investment Company, of Ketchikan, Alaska, is building a sawmill preparatory to the construction of a pulp mill of 50 tons daily capacity. Representatives of a Norwegian company have also been in Southern Alaska for the purpose of investigating possibilities for the erection of a large pulp mill. The concern has a \$2,000,000 pulp mill in Norway. The location of the Orchard interests is in the heart of one of the greatest pulpwood districts in the world. The proposed source of power is a lake of an area of about 2,000 acres. There is an available drop of 130 feet close to the mill site.

The State of Maine now has what is belived to be the only paper mill in the United States making the India paper, which has of late been found useful in printing large encyclopedias, as it is a paper very fine in texture, very thin, very light and very strong. This paper has heretofore only been made in England. The S. D. Warren Paper Co. has recently installed a machine for making this paper in its mill at Gardiner, Me. On it is made a paper that has just twice as many sheets to the pound as the ordinary book paper. The installation of this and additional similar machines may mean the revival of the growing of flax in large quantities here in Maine, as the paper is made from flax fibres.

The cases of the State Department of Health against the Hammermill Paper Company of Erie, Pa., and the Watson Company, which were to have been tried during the past fortnight before Alderman Bassett, have been continued indefinitely. The companies were proceeded against for dumping refuse from their plants into the lake. The State Department has indicated that the continuance is merely a probationary period to give the defendants an opportunity to eliminate the pollution.

The Augusta Paper Company, of Augusta, Ga., was placed in voluntary bankruptcy last week, when United States Deputy Clerk C. J. Skinner, Jr., filed the papers, drawn up and signed by the president and general manager, H. W. Jernigan. The firm gave as their liabilities \$7,366.09, and assets amounted to \$3,977.19.

Ground will be broken at Syracuse, N. Y., for the New York State College of Forestry building this week, according to word received by Dean Hugh F. Baker from Gustave De Kimppe, of Hoboken, N. J., the contractor. Plans and specifications for each sub-contractor have been forwarded and will be turned over to the contractors in the next few days. In the basement of the building there will be two departments of unusual interest to visitors as well as being of great value in the carrying on of the work of training expert foresters. One of these is a complete paper plant, which will be located on the front of the building to the right of the central hall. In the back of the building, to the left of the central hall, there will be located a timber testing room.

We understand that arrangements are about completed for the thorough re-organization of the company, and that a complete new plant would be built and equipped, making it one of the most modern and up-to-date on the Continent. London and New York capitalists are behind the new proposition. The creditors of the company have been paid in full. Plans are about completed for the purchase of extensive timber limits in the vicinity of the plant. Mr. J. L. McNiel, the general manager, is at present in Toronto disposing of the stock of paper on hand at Millerton.

Toronto Paper Co. Annual

The annual meeting of the Toronto Paper Manufacturing Co. was held in Toronto this week. A. W. Briggs, who has been secretary of the company, was elected a director to fill the vacancy caused by the resignation of J. J. Sullivan, of Bangor, Me. This was the only change on the Board, which now consists of R. S. Waidie, T. H. Watson, William Briggs, R. A. Lyon, T. Albert Brown, W. J. Sheppard and A. W. Briggs. Mr. Waidie was re-elected president and T. H. Watson vice-president.

The annual report of the directors was submitted, which showed the net profits for the preceding seven months, ending March 31, 1914, of \$75,692.80, as compared with net profits for the preceding seven months, ending March 31st, 1913, of \$76,937.25. The decrease in earnings is accounted for, by President Waidie in his annual report, owing to the general trade depression which has been felt, not only in Canada but in the United States and Great Britain among the mills, and also owing to the fact that the plant had to contend with the handicap of running the mill during the period of alterations to the sulphite plant, the output of which has been increased by one hundred per cent. In the annual statement the Board adds: "Business conditions are still unsatisfactory, but we have the advantage of the money spent on improvements last year, which should help us out now. The plant is in first-class condition and it will be our object to so maintain it. In connection with improvements to plant, additional land was purchased at a cost of \$1,648.62, and this amount was charged direct to capital account. The improvements proper cost \$51,586.89, of which we have charged \$9,199.84 to buildings' account and \$35,457.05 to machinery account. The balance, amounting to \$6,930.00, we have written off. We preferred to write this amount off rather than add it to capital account and then write it into depreciation reserve. On ordinary renewals, repairs and maintenance account we spent \$19,261.95, which the business absorbed. In addition we have written off our yearly proportion of the organization account and, after paying bond interest, dividends, directors' fees, etc., we have carried forward a credit to profit and loss account amounting to \$27,534.25. Last year's balance sheet showed the sum of \$955.95 as insurance reserve. This represented insurance moneys returned to the company and was set aside for extending our sprinkler system in the mill and was so used."

The dividend, which was raised a year ago to an eight per cent. basis, was later reduced to a six per cent basis, which now prevails. Dealing with this matter the report says: "You are already well acquainted with the changes made during the year in the dividends and in view of the statements presented herewith we feel that you will approve of our action in reducing the same."

The statement of resources and liabilities for the year ending March 31 is as follows:

ASSETS.

	1913.	1912.
Capital Assets		
Land	\$822,106	\$810,300
Machinery	422,343	386,886
Improvement		3,480
Current Assets		
General	129,760	90,910
Insurance Res.	75,497	27,852

Bills Rec.	75,182	
Unexpired Ins.	874	1,865
Rental in advance	606	
Cash in Bank		45,432
Cash on hand	22	22
Organization Exp.	4,411	7,133
	<u>\$1,453,623</u>	<u>\$1,449,066</u>

LIABILITIES.

Capital Stock	\$750,000	\$750,000
Bonds	500,000	500,000
Current Liabilities.		
Bills Pay.	10,339	1,187
Accounts Pay.	56,605	40,843
Insurance Res.		955
Depreciation	109,143	109,143
P. & L. Balance	27,534	46,937

PROFIT AND LOSS STATEMENT.

Balance in P. and L. Account.		
March 31, 1913		\$46,937.25
By profits for the year	75,692.80	
Less Bond Interest Paid and		
Accrued	30,000.00	
		<u>45,692.80</u>
Less Dividends Nos. 3, 4, 5 and 6		
Paid		\$50,625.00
Less Directors' and Secretary's		
Fees		2,318.90
Less Written off Organization		
Expenses, &c.		5,221.90
Less Written off Improvement		
Account		6,930.00
Surplus		<u>\$27,534.25</u>

WILL VISIT EUROPEAN CENTRES.

Oliver Rolland of the Rolland Paper Co., St. Jerome, Que., leaves on the 23rd from New York on a two months' trip to France and Germany. While away Mr. Rolland will visit several of the large paper concerns in France and Germany, the Grenoble Technical School, the Leipzig Exhibition of Allied Paper Trades and the manufacturing plants of various supply firms in those countries. Mr. Rolland will favor the readers of the Pulp and Paper Magazine with several articles describing incidents of his trip and some of the places he will visit.

SLITTING AND RE-WINDING MACHINES

We have just received the catalogue of the American Machine Company of Brooklyn, New York, describing their paper roll cutting, slitting and re-winding machines. The subject of slitting and re-winding, which has been considered one of the simplest processes in paper manufacture, is analyzed from all sides and some very interesting facts are dealt with and analyzed. The illustrations and description of the American machines are very valuable, the various points of the machines being shown to good advantage. The illustrations show every feature of the machine as well as the methods used and the directions for setting up and operating the machines. The catalogue may be obtained on request to the company.

PULP AND PAPER NEWS

The Dunlop Pulp and Paper Co. of Selkirk, Man., has been granted a Provincial charter. The capitalization is 1,000,000.

The Laurentide Company has just closed two big paper contracts, one being for export of newsprint to Australia and the other to Texas. The new contracts, it is understood, are for delivery late in the year, as some time ago it was announced that the Laurentide output for 1914 had been practically sold in advance.

The issue in London of £246,550 in 6 per cent first mortgage guaranteed sinking fund fifteen-year sterling bonds of the Chicoutimi Freehold Estates Company, Limited, at 93 is announced. The company has acquired 400,000 acres of land from the Peribonka to the Manouan River, Quebec, which will be leased to the Chicoutimi Pulp Company.

D. J. Bennett has entered action at Osgoode Hall, Toronto, for a declaration that the Royal Bank of Canada holds as trustee for him a timber license covering forty two miles in the Parry Sound district. An injunction to restrain the Long Lake Lumber Co. from cutting on this area is also asked.

Authority has been granted by the legislature to the Bathurst Lumber Company to build a dam on the Nepisiguit River, where it is proposed to put up a pulp and paper plant that it is estimated will cost \$3,000,000. The agreement with the provincial legislature, however, stipulates that the company is to pay the government two dollars per horse-power a year for any power sold and not used in the paper plant.

Notices have been sent advising that the Abitibi Pulp and Paper Co. is going into voluntary liquidation, but this is simply a winding up of the affairs of this company, which has transferred all its assets to a new company called the Abitibi Power and Paper Co. This new company is continuing the construction of a paper mill, which it is expected will be in operation by July, 1915.

A. Barnet & Company Limited, Renfrew, Ont., have been granted a Federal Charter, which includes very wide powers, including the right to manufacture, produce, import, buy, sell and otherwise deal in pulp, mechanical and ground wood pulp, sulphite and pulp paper, etc. The incorporators are Alexander Barnet, James Barnet, T. F. Barnet and J. G. Barnet of Renfrew, and J. C. Browne, of Ottawa. The capital stock is \$250,000.

The Federal Paper Company, Limited, of Montreal, are recently incorporated with a capital stock of \$100,000, to manufacture, buy, sell and deal in pulp, pulp-wood, paper and kindred materials and to carry on the business of a paper mill and dealer in all its accessories.

The news machine being built by the J. H. Horne & Sons Co., of Lawrence, Mass., for the Brompton Pulp and Paper Co. will be especially constructed to make a continuous sheet at the rate of 700 ft. per minute. It will have wire 160 inches wide and will produce a trimmed finished roll of paper 150 inches to 152 inches wide, ready for the printing press.

The William Beatty Lands and Timber Co., Ltd., of Parry Sound, Ont., has been recently incorporated with a capital of \$100,000.

The Box factory of the Turner Lumber and Pulp Co., at Limoilon, Que., was destroyed by fire on May 3. Arrangements have been made whereby the box business will be carried on until the factory is rebuilt. The loss is estimated at \$20,000.

In reference to the flax decortiating concerns which have been established in Western Canada, James A. Brook has written to Hon. W. T. White, Minister of Finance, Ottawa, that the federal government is merely asked to offer encouragement to induce the development of an efficient machine and the institution of that business, and is not petitioned to pay one cent until a commercial spinnable fibre has been actually produced. Mr. Brook points out that if efficient decorticators were in successful commercial operation to lay there would be no necessity or justification for government aid, and that, if western interests have failed after expending over a quarter million dollars to develop an effective decorticator, it is obvious that there is greater need and the greater justification for government assistance in this matter.

Work is progressing admirably in installing the equipment of the new ground wood mill of the Abitibi Pulp and Paper Co., at Iroquois Falls, Ont., and it is expected by Superintendent Whyte that the plant will be in operation next month. A large proportion of the output of ground wood pulp has already been contracted for. Construction on the 225 ton paper mill has also been started and this branch of the great undertakings of the company it is hoped, will be running in a year from this month.

The bill to prohibit corporations, license holders and public contractors from making political contributions to campaign funds has been passed by the Ontario Government.

W. D. Gilleau of Montreal, who represents several firms in the matter of paper mill supplies, felts, etc., has gone on a business trip to the Old Country.

It is understood that the Department of Lands, Forests and Mines of Ontario, is receiving a large number of inquiries, both from Canadian and foreign capitalists in reference to the area on the Frederickhouse and Abitibi rivers, for the right to cut pulp wood on which tenders are being asked and will be received up to June 8th. The usual stipulations are made in connection with the bids for the limits and the successful tenderer will be required to erect a pulp and paper mill to convert the pulp-wood into the finished products.

The Ontario Railway Board had brought before it a few days ago two points concerning Fort Frances, both of which it decided to hold over until June 16, when the Board will make an investigation at the place mentioned. One matter related to the assessment of the Ontario and Minnesota Power Co. for \$600,000, it being claimed on behalf of the company, that the amount was excessive. Counsel for Fort Frances took the attitude that the rate was reasonable and that the appeal was not warranted. The other matter was a request from the town that permission be granted to extend the municipal boundaries to the international

line which annexation would mean the absorption of McAlpine township.

A decision of importance to the extensive power propositions on both sides of the St. Mary's River at Sault Ste. Marie has been reached by the International Joint Commission. The joint application of the Michigan Northern Power Co. of Sault Ste. Marie, Mich., and the Algoma Steel Corporation of Sault Ste. Marie, Ont., to erect compensating works at a point in the St. Mary's river between the two cities was approved, upon certain conditions with respect to the construction of the works, which have been recommended by the Government Engineers of the United States and Canada, and also upon other conditions governing the works after their construction. The formal reply of the Commission to the applicants will be made at the next meeting to be held in New York on May 25 at which time there will also be taken up the question of the water pollution in the St. Mary's river.

H. B. Hart, manager of the British American Wax Paper Co., Toronto, has returned from an extended trip to England. He reports the demand for wax paper for wrapping bread is constantly increasing and that a number of Canadian towns either have passed ordinances requiring all bread to be wrapped or are considering such a step. The Holden-Morgan Co., Toronto, which some months ago placed on the market a bread wrapping machine, have sold six of them to the Canada Bread Co. for their plants in Winnipeg, Montreal and Toronto, where they are now in successful operation. Several other Canadian bakeries are also wrapping a portion of their output. The Holden-Morgan Co. have just invented a semi-automatic wrapper for use in the smaller plants. The loaf is wrapped by hand, but the machine makes the bottom and end folds, the end folds being fastened by sticks.

J. L. Englehart, of Toronto, Chairman of the Timiskaming and Northern Ontario Railway Commission, who recently returned from a tour of inspection of the road, is full of enthusiasm over the north country and the development which is in progress. He says it is hard to realize that the settlers are doing so well, and reports that the operation of the Abitibi Pulp and Paper Co. at Iroquois Falls, who are spending four million dollars in the construction of pulp and paper mills, will do a great deal in providing a home market for the residents up north in the matter of pulp wood. Mr. Englehart added that there will be taken out this year ten thousand telegraph poles, three hundred thousand railway ties and fifty thousand cords of pulpwood which means that all this money will come right back into the hands of the settlers. They will get about thirty-three thousand dollars for the poles and a quarter of a million for the pulp wood.

The Lincoln Paper Mills, of Merritt, Ont., are now turning out a striped sulphite paper in several colors for the use of druggists, men's furnisiers, stationers and other special lines of trade which is taking very well.

The British Columbia Sulphite and Fibre Co., who own a pulp mill on Howe Island, B.C., recently bought from the Provincial Government about eleven hundred acres of timber on the Little Channel and will undertake to have the area cleared in three years. The holdings comprise six million feet of hemlock, three million feet of cedar and two million feet of larch. The hemlock and larch brought ten cents a thousand in addition to the royalty and the cedar twenty five cents a thousand. For nine hundred and fifty acres

on Broughton Island, which were also bought by the British Columbia Sulphite and Fibre Co., fifteen cents were paid for the hemlock and birch and forty cents for the cedar in addition to the royalty. The timber limits contents of the latter are nine million feet of hemlock, four million feet of larch and one and half million feet of cedar.

The soda pulp output of the Barber mill at Georgetown, Ont., has been increased one third recently by the addition of new cookers. In accordance with the policy of the St. Lawrence Paper Mills Co. to have the surroundings of all their mills attractive and inviting, flowers and shrubs have been planted during the past few days, lawns sodded and other improvements made which make beauty spots of the grounds.

James Chambers, of Chambers, Limited, Toronto, is removing his office from 152 Bay Street to the Bell Telephone Building on Adelaide Street West. W. J. Trimble, general contractor, who has done much work for paper mills, will also have an office in the same building. Mr. Chambers has branched out in the manufacturing line and has started a machine shop at 80 Don Esplanade where parts and repairs for paper machine, road machinery, etc., will be made.

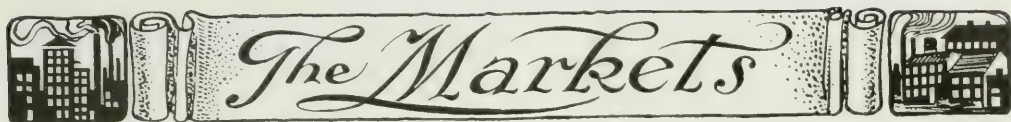
The water in the old Welland canal, from which many pulp and paper concerns derive power will be shut off for a week or ten days, starting on May 23, at the request of the industries. Several of the plants along the route will take occasion to do some overhauling, while weirs, water wheels, etc., will be given their annual cleaning out. The Kinloch Paper Mills at St. Catharines, will have new reinforced concrete floors laid in their beater room and in the flat above, the Albertson Engineering Co. of Toronto, having charge of the plans. New beater tubs will also be installed by the Waterous Engine Works Co. The Montrose Division of the St. Lawrence Paper Mills at Thorold will also have a concrete floor laid in part of the old mill.

It is understood that the suit, which was brought against F. H. Anson and Shirley Ogilvie of the Abitibi Pulp and Paper Co., by John A. McAndrew of Toronto, former secretary of the company, for an account of profits due under an agreement of commission on sale of stock and interest on certain amounts has been settled.

Mr. Davis of Kilmer, Irving and Davis, barristers, Toronto, acting on behalf of the Abitibi Power and Paper Co. Limited, Toronto, has been busy adjusting claims for drowned lands on the Abitibi and Black Rivers in connection with the construction of the dam of the company at Iroquois Falls which resulted in flooding some three thousand acres belonging to the settlers. All the claims have been satisfactorily settled. Certain lands on the shores of Lake Abitibi which belonged to the provincial government and were flooded, have also been adjusted so far as any claims are concerned.

W. H. Rowley and George H. Millen of the E. B. Eddy Co. Mill, were on a visit to the Toronto, London and other branches of the company last week. Mr. Rowley, who had been in rather poor health all winter, has completely recovered as a result of his sojourn in the south.

The new plant of the Dominion Pulp Co. at Chatham, N. B. was put into operation last week. A complete new plant has been installed for the manufacture of news sulphite pulp, the capacity being 50 tons per day. Large limits have recently been purchased



CANADIAN MARKETS

The market conditions show improvement in some lines with the advent of warm weather, although matters have a long way to go before the buoyancy of a year ago will be felt. In news print business, the tide appears to have turned and some favorable foreign contracts have been made by leading mills. Prices are a little firmer, and, while some of the plants are not rushed, the majority are working on orders which will keep them going well until the end of the year. One large company reports during the past week as having concluded negotiations for heavy shipments to Australia and to Texas.

The war scare in Mexico has had the effect of many dailies across the line using more print paper by reason of enlarged number of pages and extra editions. In book and writing line the conditions remain about the same. Printing trade has been rather quiet for some time and mail order and catalogue houses report that business has fallen off, which means less printing and paper from large establishments. In ground wood, most of the mills are running on contract, and, while there are some inquiries, still buyers are hanging out for lower prices than several plants are willing to accept. Sulphite figures are well maintained and stocks are low. Paper jobbers report business during the month as only fair and orders for the most part small. The quietness of the shoe and other trades in the manufacturing line has had the effect of curtailing the output of paper box plants which make cartons. Wrapping papers are exceeding dull and price cutting still goes on in order to secure what business is going.

A leading paper house stated this week that banks, insurance corporations, security companies and other financial institutions, which had bought the very best bond and ledger papers in the past, were conservative in the matter of orders and were taking cheaper grades in many instances to meet their immediate demands.

The rag and paper stock market is only marking time and no heavy trading is done in any lines beyond the hand-to-mouth supplies. Roofing stock is a little stronger. All paper concerns are, however, confident that the present quiet condition of affairs will revive in all lines. It may take a few months to go, but there are undercurrents such as the organization of many new concerns, which show that capitalists are getting ready to go ahead with several projects just as soon as the monetary situation warrants a renewal of confidence.

The following prices prevail, f.o.b., Toronto

News rolls, \$1.95 to \$2 at mill, in carload lots.
 News (sheet), \$2.10 to \$2.20 at mill in carload lots.
 News (sheet), \$2.25 to \$2.50, depending on quality.
 Book papers (carload), No. 3, 3.75c to 4.25c.
 Book papers (ton lots), No. 3, 4c to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c to 6.00c.
 Writings, 5c to 7½c.
 Sulphite bond, 6½c to 7½c.
 Grey Browns, \$2.00 to \$2.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

Manila, No. 2, \$2.85 to \$3.50.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$3.90 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$15.50.
 Ground Wood, \$21 to \$23, delivered in United States.
 Sulphite (unbleached), \$41 to \$43, delivered in Canada.
 Sulphite (unbleached), \$42 to \$44, delivered in United States.
 Sulphite (bleached), \$55 to \$57, delivered in Canada.
 Sulphite (bleached), \$56 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 50c.
 White blanks, 7½c to 90c.
 Heavy ledger stock, \$1.40 to \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c to 75c.
 No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 25c to 27½c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.30 to \$1.32½.
 No. 1 white skirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinetts, 75c to 80c.
 Flock, 90c.
 Tailor Rags, 70c to 75c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5½c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.

White, \$2.10 to \$2.50.

Manila B, \$1.50 to \$2.25.

Most of the manufacturers are quoting 10 per cent. less than the above prices to the jobbing trade on the cheaper lines of wrapping, such as B. Man., No. 2 Man.—grey and red browns.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.

News quality, \$41 to \$42 per ton.

Bleached sulphite, \$54 to \$59 per ton.

Kraft pulp, \$3.60 to \$4.00.

Ground woods, No. 1, \$15 to \$16.

Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

Office Pulp and Paper Magazine,

206 Broadway, New York.

There has been no marked change in the general conditions governing the local market for ground wood pulp. The tone is healthy and the feeling among dealers is that the year will be a good one. Spot orders are rather sparse, but good prices are obtained for such orders. No deals have been closed in the local market for strictly No. 1 ground wood pulp at less than \$21.50 a ton delivered. Plentiful water supplies have enabled grinders to make good sized stocks of pulp, much of which is already contracted for, with future deliveries. Some manufacturers have already contracted for the current year's capacity and in one instance, for more than that. Contracts are not closed in the local market at less than \$16.50 at the mill and in the interval some grinders held out for a still better price. This is due to the heavy consumption of newsprint during the war scare period, when metropolitan dailies exceeded their normal consumption, on an average, by about 40 per cent. Delivered values for No. 1 pulp are quoted in the local market at \$20.50 to \$24 a ton.

Old waste papers have been the really active market for paper stock. Although board mills are not as active as they have been, there is still a fair demand for the lower grades. Old newspapers, strictly overissue, are commanding 67½¢ a hundred pounds, and strictly folded are quoted at 50¢ a hundred pounds. The continued activity at book paper mills has had a steady good influence on the higher grades. Flat stock of all description is moving in good way at prevailing values, which are firm. White shavings are in good demand and the current values of \$2.40 a hundred pounds for hard shavings is firm. Soft shavings are not very plentiful and they are commanding about \$2.12 a hundred weight.

Pulp.

Ground Wood, No. 1, \$20.50 to \$24, delivered.

Ground Wood, No. 1, \$20 to \$24, delivered.

Ground Wood, No. 2, \$15 to \$17, delivered.

Unbleached sulphite, dom. 4.90 to 2.20 delivered.

Unbleached sulphite, impt. 1.10 to 2¢ ex dock, New York.

Bleached sulphite, domestic, 2.80 to 3¢ delivered.

Bleached sulphite, impt. 2.00 to 2.90 ex dock, N.Y.

News Quality, impt. 2 to 2.20 ex dock, N.Y.

Ground wood, impt. 1.10 to 2.10 ex dock, N.Y.

Ground wood, impt. 2.00 to 2.80 ex dock, New York.

Kraft pulp, impt., 1.80¢ to 1.90¢, ex dock, N.Y.

Soda pulp, domestic, 2.10¢ to 2.15¢, delivered.

Paper

There is a quiet but healthy tone to the local paper market in general. There is practically no big business going on in any grade except news, which has been in very active demand since the sensational execution of several convicts a few months ago, when heavy editions and extras were printed by the metropolitan dailies. Other grades are in quiet demand and orders are in nearly all cases for actual and immediate use. Such orders necessitate a good deal of book-keeping, but in the end have proved very profitable, especially in the jobbing trade. Jobbers, however, are running in low stocks and have cut well into their reserve supplies. When they place orders with mills it is generally desired that prompt delivery be made, which is a good sign that the order is for only a small job lot that was asked for by a consumer.

There is a good deal of disgust and indifference reflected in the talk of the trade concerning business. The general quietness that has existed for about three months has caused the trade to take a peculiarly lassitudinous attitude toward business. The past week has brought about a little better feeling, particularly among manufacturers who realize that the jobber is not carrying any reserve stock. Consumption has continued just the same, although consumers are not buying ahead or carrying any reserves. They have cut down the retailers' and jobbers' stocks to such an extent that it will not be long before a steady, growing demand will begin. There were many extras and heavy editions printed by metropolitan newspaper publishers during the threatened war with Mexico. Heavy editions still continue and the consumption of news has increased in the interval about 40 per cent. There has been no change in price, but if the present rate of consumption continues there will be an advance. Sheet news is very firm at prevailing figures, which are 2.25¢ to 2.30¢, delivered. Side runs are plentiful and values are low. Some mills have closed deals for counter rolls as low as 1.80¢, at the mill. Even the larger sizes are not commanding more than 2¢, delivered. The manila and fibre market has been rather quiet from the manufacturing point of view, but small orders among jobbers have totalled in many cases a larger tonnage than the same period last year. Values in all grades are firm. There is a little brisker demand for the lower grades. Book papers are firm at prevailing quotations, which are likely to be advanced in the near future. There has been a little improvement in deliveries by manufacturers. Specialty papers are in active demand all over, although there has been some easing in the demand for cover paper. This is attributed to the falling off in the number of special issues among periodical publishers, most of whom have already turned out their spring numbers. Toilet papers and paper towels are in fairly good demand. Cigarette papers continue to move actively at prevailing prices, which are fairly high. There is only a poor demand for paper bags, but there is very little price cutting. Coated papers are in softer tone, but values are well maintained. The tissue market has been very quiet. Prices are low and the demand is poor. Certain local jobbers have attempted to bear the market by reports that they had purchased 4,000 ream lots of No. 1 white tissue at 38¢. No manufacturer could afford to sell as low as that was the opinion of the local agents and manufacturers. Manila tissues are unchanged in value. Kraft tissue has been fairly active at 47½¢ to 50¢. Bonds, writings and ledgers are in fair demand.

There seems to be no new business in this field, as one manufacturer reports good business and another poor. The situation seems to be that they are taking business from each other, but not creating any new field of consumption. As the spring demand for boxes has eased, there has been a slackening in the demand for boards of all grades. There has been no change in prices, however.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
 News, side runs, \$2 to \$2.10 f.o.b. mill.
 News, sheet, \$2.25 to \$2.30 f.o.b. mill.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper superfine, 13½¢ to 17¢, del. east of Miss. River.

Writing paper, extra fine, 11¢, del. east of the Miss. River.

Writing paper, No. 1, fine, 9¢, del. east of the Miss. River.

Writing paper, No. 2, fine, 8¢, del. east of the Miss. River.

Writing paper, engine sized, 4½¢ to 8¢, del. east of the Miss. River.

Bond paper, 5¢ to 24¢, delivered east of Mississippi River.

Ledger paper, 8¢ to 30¢, delivered east of Mississippi River.

Linon paper, 7¢ to 18¢, delivered east of Mississippi River.

Manila jute, 4¾¢ to 5¼¢, delivered.

Manila, wood, \$2.40 to \$3.00, delivered.

Kraft, No. 1, \$3.50 to \$3.75 f.o.b. mill.

Kraft, No. 2, \$3.25 to \$3.50, f.o.b. mill.

Boxboards, news, \$30 to \$33 per ton, delivered.

Boxboards, chip, \$28 to \$31 per ton, delivered.

Boxboards, straw, \$28 to \$31 per ton, delivered.

Wood pulp board, \$42.50 to \$45 per ton, delivered.

Tissue, white, cylinder, 40¢ to 42½¢, delivered.

Tissue, fourdrinrie, 47½¢ to 50¢, delivered.

Tissue, jute Manila, 40¢ to 42½¢, delivered.

the whole the British paper market shows a more promising outlook.

The market for sulphite is still dull and the amount of business passing is very small. Sulphite has been more enquired for and a few prompt orders have been given out by mills. From Scandinavia and Germany reports reach London that business in chemical pulps is very slow. Prices are about as follows:—

Sulphite Bleached (No. 1)	\$56.40 to \$62.00
Sulphite Easy Bleaching (No. 1)	37.20 to 39.60
Sulphite News	38.20 to 39.20
Soda Unbleached (No. 1)	34.80 to 36.40
Soda Kraft	38.00 to 38.50

All prices are c.i.f. British ports.

The mechanical pulp market shows no improvement and mills are doing practically no business with importers. Deliveries on contract are arriving in fair quantities. Norwegians report numerous enquiries and that prices are inclined to be hardened. The German and Swedish reports are to the effect that the markets are featureless. Prices are about as follows:—
 Pine, 50 per cent. moist (unwrapped), \$10.00 to \$10.70
 Pine, dry 22.40 to 30.20

All prices c.i.f. British ports.

Straw pulp manufacturers on the continent are sold well ahead for some months and prices are very firm. Esparto is becoming dearer and the market is quiet with little enquiry and no pressure to sell. Trade in rags of all descriptions is good, but supplies are somewhat short and prices are consequently very firm.

The chemical trade is fairly active. Caustic Soda has slightly advanced and for 76-77 per cent. the price quoted is \$48.50 per ton. Bleaching Powder is \$26; Soda Crystals, \$11.60 and Salt Cake, \$9.90 per ton, delivered. Ammonia Alkali is unchanged at \$16.40. Sulphur is scarce and firm for some weeks past. China clay manufacturers are now being approached with a view to settling up 1915 contracts and there are no signs of prices easing. Prices of other fillings, such as gypsum, mineral white, etc., are unchanged, but makers report a falling off in the orders from paper mills compared with this time last year.

THE BRITISH MARKETS

(Special to Pulp and Paper Magazine).

The outlook in the British paper industry is more hopeful now than has been the case for some months past. Still, it must be admitted, the volume of business passing on home and export account is not what manufacturers would like it to be, and those engaged in the allied trades, such as chemical, fillings, and pulp report that the orders received from paper mills are considerably below those placed during this time last year. Newsprint and kraft have been mostly affected since the beginning of the year, but now business in these branches of the industry has somewhat revived and there are signs of a good undertone. The demand for fine printing papers and fine writings is fair, while the export trade shows improvement. Cheap printing paper has recently found a good consuming channel, and the same may be said in regard to cardboard and wood pulp boards. There is a good call for wrappings of a cheaper kind, and in this respect the foreign imports are finding a good outlet. Manufacturers of esparto papers are experiencing a crucial time owing to the high cost of the raw material and the difficulty in laying in substantial stocks. Whenever possible an effort is made to increase prices, but this is always a difficult problem to solve with clients. Prices of esparto are inclined to go higher and it is feared the finished product must move likewise all round. On

DEATH OF JAMES REID WILSON IN LONDON

The announcement of the death of Mr. James Reid Wilson in London, Eng., on May 11 last, was a shock to his many friends in commercial and financial circles in this country. Mr. Wilson had been ailing for some time. His death was caused by pneumonia.

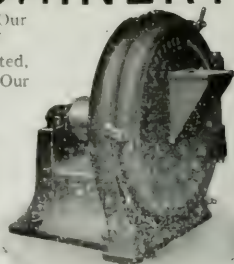
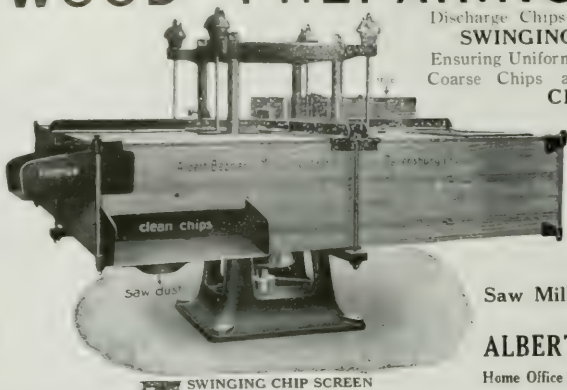
The late Mr. Wilson was one of the most prominent men in the Dominion, and for many years one of Montreal's leading citizens. He was connected with Messrs. Thomas Robertson & Co. since 1871, having been made president of the company in 1876, which position he held up till his death. Besides his interests in many other companies throughout the Dominion, he took a deep interest in the paper industry and was a director of the Wayagamack Pulp and Paper Co., holding a considerable interest in the company.

W. A. Newton, Toronto, Canadian manager of the Albertson Engineering Co., of Kalamazoo, Mich., has secured a patent on a new beater and washing engine, which it is reported effects a great saving in power, and possesses many other advantages. The beater is of the revolving type.

The management of the Nicolet Falls Pulp and Lumber Company, at Nicolet Falls, Que., expect to commence operations for this season next week, the drive of logs being about all down.

WOOD PREPARING MACHINERY

Discharge Chips from Chipper into Our
SWINGING CHIP SCREEN
Ensuring Uniform, Clean Chips. Rejected,
Coarse Chips are Conveyed into Our
CRUSHER



and reduced to usable
size, without making
SAWDUST. KNOTS
being crushed out.
Production is Thus Increased
and Quality of Pulp Improved.

OUR CRUSHER
also makes

Saw Mill Refuse Available

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Established 1833



TENDERS FOR WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Monday the 8th day of June 1914 for the right to cut wood of various descriptions on a certain area tributary to the Frederickhouse and Abitibi Rivers in the District of Temagami.

Tenders shall state the amount they are prepared to pay as bonus in addition to the ordinary Crown dues. In addition the tenderer shall specify what other products, or such other portion of the wood from time to time to be cut, the Tenderer-Governor in Council has the right to operate wood products mills on or over the wood selected for.

Such tenderer shall be required to erect a mill in conformity with the conditions and to put in place the wood 1914 products thereof in the Province of Ontario.

Tenderer making tender will be required to deposit with the tenderer a certified cheque payable to the Hon. the Minister of the Province of Ontario for \$25,000 or the equivalent of those tender to be deposited in the hands of the Receiver-General of the Province of Ontario.

The tenderer will be required to deposit with the tenderer a certified cheque payable to the Hon. the Minister of the Province of Ontario for \$25,000 or the equivalent of those tender to be deposited in the hands of the Receiver-General of the Province of Ontario.

W. H. HEARST.

Minister of Lands, Forests and Mines
Toronto, Ontario, 25th April 1914.



TENDERS FOR ALLAN WATER RIVER WOOD LIMIT.

TENDERS will be received by the undersigned up to and including Wednesday, the 15th of July next for the right to cut trees from Spruce, Balsam, Hemlock or Jack Pine, Poplar and Whitewood trees seven inches and upward in diameter two feet from the ground sufficient to supply a tie preserving plant for a period of twenty-one years from unoccupied, unsold and unlocated lands of the Crown tributary to what is known as the Allan Water River, tributary to the Grand Trunk Pacific Railway in the District of Thunder Bay.

Tenders shall state the amount they are prepared to pay as bonus in addition to the Crown dues of \$2 per thousand feet board measure for anything not manufactured into ties, and for ties at the rate of 36 cents or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council.

Such tenderer shall be required to erect within the limits of the territory covered by the right to cut trees, at some other place approved by the Lieutenant-Governor in Council a tie preserving plant.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for \$25,000 or to remain on deposit as security for the carrying out of the conditions of their tender.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc. apply to the undersigned.

W. H. HEARST.

Minister of Lands, Forests and Mines
Toronto, Ontario, 25th April 1914.



SALE OF PINE TIMBER ON METAGAMI INDIAN RESERVE.

Tenders will be received by the undersigned up to and including Monday the 8th day of June 1914 for the right to cut wood of various descriptions on a certain area tributary to the Frederickhouse and Abitibi Rivers in the District of Temagami.

Tenders shall state the amount they are prepared to pay as bonus in addition to the ordinary Crown dues. In addition the tenderer shall specify what other products, or such other portion of the wood from time to time to be cut, the Tenderer-Governor in Council has the right to operate wood products mills on or over the wood selected for.

W. H. HEARST.

Minister of Lands, Forests and Mines
Toronto, Ontario, 25th April 1914.



TIMBER SALE.

TENDERS will be received by the undersigned up to and including Monday the 8th day of July 1914 for the right to cut the 1914 and 1915 Pine Timber on lots 1, 2 and 3 Township of Elberta in the District of Nipissing.

The tenderer will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario for \$25,000 or to remain on deposit as security for the carrying out of the conditions of their tender.

The highest or any tender not necessarily accepted.

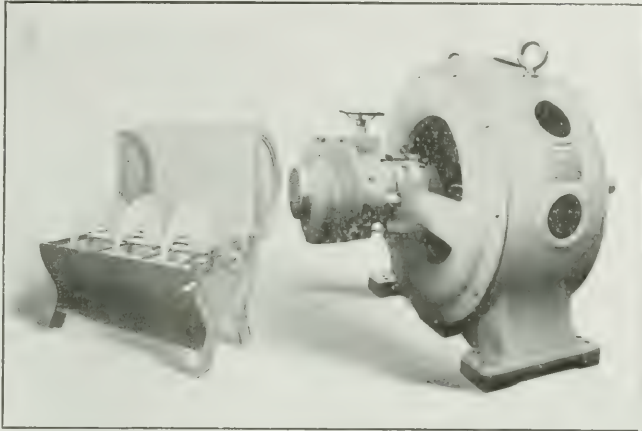
W. H. HEARST.

Minister of Lands, Forests and Mines
Toronto, May 10, 1914.

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SIEMENS WOUND ROTOR INDUCTION MOTOR AND LIQUID STARTER.
MOTOR FITTED WITH OUR STANDARD BRUSH LIFTING AND SHORT
CIRCUITING DEVICE.

We have in Montreal a large stock of squirrel cage 550 Volts 60 cycle and 25 cycle motors and can give prompt shipment.

We shall be glad to quote you on your requirements for all kinds of electrical apparatus.

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent

PUBLIC NOTICE is hereby given that on **WEDNESDAY, August 5th, 1914, at 10 o'clock A.M.**, the Liquidator of the insolvent after mentioned will be selling 199 lots of timber limits, which he serves, at the office of Messrs. LaRue & Trudel, Auctioneers, 126 Main Building, 126 St. Peter Street, Quebec.

Sq. Miles.

Lot	No.	181 River St. Jean, No. 1	1
"	"	182 River St. Jean, N.E. River, No. 1	1
"	"	183 River St. Jean, P.E. River, No. 1	1
"	"	184 River St. Jean, No. 1	1
"	"	185 River St. Jean, No. 1	1
"	"	186 River St. Jean, No. 1	1
"	"	187 River St. Jean, No. 1	1
"	"	188 River St. Jean, No. 1	1
"	"	189 River St. Jean, No. 1	1
"	"	190 River St. Jean, No. 1	1
"	"	191 River St. Jean, No. 1	1
"	"	192 River St. Jean, No. 1	1
"	"	193 River St. Jean, No. 1	1
"	"	194 River St. Jean, No. 1	1
"	"	195 River St. Jean, No. 1	1
"	"	196 River St. Jean, No. 1	1
"	"	197 River St. Jean, No. 1	1
"	"	198 River St. Jean, No. 1	1
"	"	199 River Chambers, No. 1	1

A total of 197 square miles more or less. Also a certain area of freehold land to be used as a point of sale when fully described in deeds in the hands of the same named department.

Conditions of Sale. The full amount of the purchase price, the balance payable upon transfer of the licenses, which transfers will have to be made at once, the transfer fee to be payable by the purchasers.

The purchaser will pay in addition to the purchase price, the auction duty of one per cent and will accept the licenses on their own without any responsibility on the part of the estate, and to the condition, amount and quality of the timber.

For inspection of the licenses and other particulars please apply to the undersigned.

A. P. C. ROSS, Messrs. P. S. Ross & Sons,
126 Notre Dame St. West, Montreal.
EUGENE TRUDEL (Messrs. LaRue & Trudel),
Building Commission, 126 St. Peter St., Quebec.

**USE
MORRIS
CRANES
THEY'LL
BOOST
YOUR
GAINS.**

**THE HERBERT MORRIS CRANE
& HOIST COMPANY, Limited.**
EMPRESS WORKS, Peter Street, TORONTO.

COMMISSION TO INVESTIGATE CHARGES.

Sir Frederick Barker, formerly Chief Justice of New Brunswick; Judge McKeown, of the Supreme Court bench; and W. S. Fisher, of the firm of Emerson and Fisher, hardware merchants, St. John, have been appointed by Lieutenant-Governor Wood a commission to enquire into charges made by L. A. Dugal, M.P.P. for Madawaska, against Premier Flemming, and H. F. McLeod, M.P. for York County. Mr. Dugal charged that the Premier had extorted large sums of money from the lumbermen of the province in connection with their Crown land issues, and that Mr. McLeod had demanded and received a sum of money from a St. John Valley Railway contractor to which he was in no way entitled while he was Provincial Secretary of the province.

A CONTINUOUS WINDER.

W. Berkerly West, of Montreal, has invented a continuous winder for a paper machine for winding small rolls. The idea of the attachment is to obviate the stopping of the machine when changing rolls. Mr. West has applied for a patent for his invention.

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Timber Concessions in the Province of Quebec

Notice is given by the Government of the Province of Quebec, that, on the 11th of August, and on the 20th of October, 1914, permits to cut timber on over 8,000 square miles of Crown Lands will be offered at public auction.

The territory to be disposed of comprises some 1,200 square miles in the basins of rivers Ottawa, Harricana and Bell, in the Abitibi region; 6,000 square miles in the Lake St. John northern region; 550 square miles in the Lake St. John East agency; 242 square miles in the Matapedia division.

On the first date above mentioned, permits will be offered at ordinary conditions on some 3,000 square miles.

The timber grants advertised for the 20th of October, comprising the basins of three large rivers in the Lake St. John region, with considerable water powers, will be subject to the obligation of manufacturing the wood into pulp or paper within the province of Quebec.

For particulars, please apply to the Department of Lands and Forests, Quebec, Canada.

ELIZ. UVILLE DECHENE,

Deputy-Minister of Lands & Forests.

Quebec, 11th April, 1914.



TIMBER SALE

TENDERS will be received by the undersigned up to noon of the 6th day of July, 1914, for the right to cut the Red and White Pine timber on Berths 1 B, 1 C, and 1 D, in the Mississauga Forest Reserve tributary to the north shore of Lake Huron, each Berth containing an area of 36 square miles, more or less.

For maps and conditions of sale apply to the undersigned or the Crown Timber Agents at Thessalon, Sault Ste. Marie, Webbwood and Sudbury.

W. H. HEARST,

Minister of Lands, Forests and Mines, Toronto, April 18th, 1914.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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Roy L. Campbell, Editor

A. G. McIntyre, Contributing Editor

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SUBSCRIPTION to any address in Canada, \$2.00—Elsewhere \$2.50 (10 shillings). Single Copies 20c.

VOL. XII.

MONTREAL, JUNE 1, 1914

No. 11

A Menace to Prosperity

In the past three weeks we have had in almost every part of the Dominion a recurrence of one of our greatest national evils. Forest fires are reported in the Maritime Provinces, Gaspé, Western Quebec, the Ottawa Valley, Northern Ontario and British Columbia. Timber limits, mills and towns have been endangered and in some cases have fallen prey to the flames. The River St. Lawrence has been so overcast with smoke as to render navigation dangerous, and in Nova Scotia and Ontario hundreds of people have been forced to abandon their property and flee for their lives. Coming at the beginning of the summer, these fires augur ill for the near future, when the weather will be warmer and the woods dryer. Some portions of Northern Ontario stand in particular danger, since the great storm which swept over the Great Lakes last fall blew over the shallow-rooted trees on great areas. When the tops dry out, the fire hazard will be very great. Indeed, it may be safely said that these areas of wind fall are certain to be burned over. And if the experience of the last two generations teaches us anything, it is that our green timber is in jeopardy to almost as great an extent.

Leaving out of consideration altogether the immediate losses of timber, pulpwood and movable property, the losses which are going on year after year are such as the country cannot afford to sustain. The report of Dr. C. D. Howe and Mr. J. H. White, experts who have investigated conditions in the Trent Watershed in Central Ontario for the Commission of Conservation during the past two summers, shows conclusively that it is utterly impossible for commercial timber lands to withstand repeated fires. The land is so impoverished that even the poorest tree growth is wiped

out. And yet year after year we allow our forests to be ravished by fire. We have long since passed the stage when this is a transitory ill. Sentimentalism may once have existed in connection with claims for forest protection; such was possible while there were millions of acres of rich timber. But the rise of lumber prices in the past twenty years, far exceeding the increase in any other standard commodity, is an indication of the scarcity of standard sizes of timber. More and more the world is tending to utilize small sizes and to substitute cement, steel, clay and glass products. The foremost product of the forest in the future will undoubtedly be its pulp. The sawmill will give way to the pulp mill, just as wooden boxes are being augmented and supplanted by cardboard boxes, and fine interior finish by pulp wall board.

Maintenance of the forest is now a matter of more vital import to the pulp manufacturer than to any other person whose raw material lies in the woods. His mill, to meet the demands of modern consumption, must be a huge affair. It costs so much as to make long term investments imperative. It cannot be readily moved. Hence the supply of pulp wood must be continuous or the concern will surely have difficulties through stress of competition. To a pulp business of the future, forest destruction is to be counted with mill destruction.

Further, it has been proven beyond a doubt that forests have an influence on waterflow; that when the forests are burned, the equability of the streams and the clearness of the water are noticeably altered. The pulp man needs even flow for power and clear water for clean pulp. If the forest cover on the watershed, in which he is operating, is burned, he is liable to get neither.

Many agencies are at work in the Dominion to prevent the spread of fires. Not the least among these are the owners of timberlands, who have in many cases spent immense sums to maintain an efficient patrol upon their lands. The Railway Commission has ushered in a new era in fire protection methods in its regulations concerning control and brush disposal along rights of way, and the Government officials are heartily co-operating in the laudable work. The Canadian Foresters Association and the Press of Canada have done great educational work among the public. The co-operative protective association has made its appearance, as in the St. Maurice Valley. But there is still practically an untouched field of endeavor. Fire risks in the woods can be reduced under efficient methods to a mere fraction of a per cent. of the value of the standing timber. Whereas some European countries are expending from two to ten dollars an acre on their forest properties, Canada is spending much less than one cent an acre. There is still a vast inertia in this country with respect to forest protection. The people do not realize the great value of the forest resources nor the imminent danger to which it is subject.

As those having most vital and lasting interest in the maintenance of the forest, pulp manufacturers can well afford to lend their aid to every movement in the direction of protection. Is not this a matter which might receive not only the support, but the active participation of the Pulp and Paper Association? Organized effort is the key to success.

EDITORIAL COMMENT

We this issue complete the series of articles on the manufacture of Sulphite Pulp, by Mr. G. B. Steffanson, which, to judge by the correspondence which has been received, has been of extraordinary interest to the members of the industry. It is not often that a subject is treated with the competence and accuracy which has been seen in this series. Mr. Steffanson's position among the top-notchers of the pulp profession, means much to the reader. The publishers of the Pulp and Paper Magazine propose to secure in the future other authorities to deal with basic subjects in an authoritative way.

With negotiations for peace between United States and Mexico going rapidly forward at Niagara Falls, Ont., and the Mexican leader Huerta in evident distress because of the attacks of the rebels, it is most probable that the threatened international hostilities will cease. This news will be received with enthusiasm by pulp manufacturers, despite the fact that a war would mean a diminution of 90 per cent. in the demand for many grades. This would lay the capacity of every mill in Canada and the United States.

The opinion of the London, Eng., Timber Trade Journal on the effect of the Ulster difficulties on Canadian forest products will be of particular interest to those firms conducting businesses where the movement of lumber to a certain extent influences the production of pulp. According to this journal, there is a noticeable depression in the spruce market. "The buyers of this material are fighting shy of purchasing except from hand to mouth, and until the political position is more settled the spruce market will not find relief there. Allowing for the difference in freights, the results to shippers should be equal to those of last year's trading. Unfortunately there seems to be generally a lack of confidence in the trade, and the sooner this pessimism is overcome the better for everybody."

POINTS WORTH KNOWING.

(Continued from Issue of May 15th.)

11. The high finish on brown wood board is obtained not only by the mechanical treatment of the finished product. The addition of paraffin, talc, graphite in the beater and the employment of well cooked cellulose and "hot-ground" wood-pulp readily enable the desired high finish to be obtained. When the board is finished by means of agate, soap-powder gives only an unstable glaze.

12. The work in the beater by no means primarily decides how the paper turns out. In rag papers the work in the sorting room is of primary importance, and in cellulose and mechanical wood-pulp papers the kind of the growth of the timber employed comes first, then the kind of cooking or grinding, and only thirdly the work in the beater.

13. The ordinary friction brake of the reeling machine and supercalender is by no means not always the best for obtaining good winding and glazing free from folds. A band-brake recently introduced into Scandinavia and England consisting of a thin steel band 20 cms. broad admits of almost perfect regulation when the paper runs badly.

14. The electric iron is without doubt preferable to all the other irons mentioned for pasting together tears in the paper web. The uniform heat of the electric iron prevents the pasted place becoming undone which readily occurs with an overheated iron.

15. Tears are preferably joined not with solutions of adhesive material, but with emulsion bands as thin as paper and about 1 cm. broad which, as is known, are ironed.

16. It is by no means always necessary to arrange a top-felt press in the paper machine. In one case the waste was diminished by 8-10 per cent by working without a top-felt press. Sufficient glaze was obtained by the moist and dry calenders.

17. In cross-cutters the grasping tongs are preferably substituted by a pneumatic distributing device.

18. Bronze beater-knives are by no means not uneconomical on account of their high price because, in contradistinction to steel knives, they still possess a considerable value for old metal after being quite worn out. In addition, bronze knives prevent white pulp becoming grey. Papier Fabrikant.

MANUFACTURE OF SULPHITE WOOD PULP

By G. B. STEFFANSON.

(Specially Written for the Pulp and Paper Magazine.)

ARTICLE III.

(Concluded from Last Issue.)

Screen Room and the Screening.

To get rid of sand and other heavy articles that collect in the pulp, from the mill yard, from the digester lining and from other sources, and to get rid as well of the largest knots before the pulp reaches the coarse screen, rifflers are extensively used.

The most common rifflers consist of one or more shallow horizontal troughs. In the bottom of the troughs are nailed, at right angles to the direction of the flow of pulp, 5 to 7 in. boards, inclined against the flow.

The pulp, diluted to at least 100 parts of water to one part of pulp, flows slowly over the edges of the cross boards to a depth of from 3 to 5 ins. The boards thus catch the heavier particles.

The rifflers should be made in so many partitions that one can be shut off for cleaning without interrupting the running of the rest of the mill. The slower the flow of the rifflers, and the greater the length, the better are the results obtained.

Care should be taken that the pulp flows evenly over the whole surface of the rifflers, and if this is not the case, and extra labour has to be used to keep the rifflers running properly, the service box should be so rearranged that the pulp flows quietly, and in equal quantities and dilution over the whole length of overflow.

When washing out the rifflers, the pulp inlet should be closed, water admitted, and the knots and sand below the boards stirred up to allow the fibres present to flow off with the water. When all good fibres are washed away, the water is shut off, one side of the rifflers is raised, and the sand and knots hosed out into spouts alongside. This stock should not be sent to the refiner direct, but should be run over a small swift current riffler, to separate the knots from the sand, pieces of brick from the digester lining, and other heavy particles.

There are other types of rifflers used, of which the author has found the following to work better and with smaller cost than any other, and to take comparatively small space. Two or more horizontal troughs about 3 ft. deep and of ample size, say for a 50 ton mill three troughs of 8 by 12 feet, built alongside each other with spouts for cleaning between. About 18 ins. apart are built vertical walls, so arranged that the pulp flows under one and over the next, and so on, in a layer at least 8 ins. deep. The sand and knots collect against the walls which go to the bottom of the troughs, and stay there. In case there are considerable quantities of resin in the pulp, the walls under which the pulp flows should be provided on the side against the flow and at the surface of the pulp, with strips of soft machine felt 6 to 8 inches wide. These will collect the resin. In these rifflers the flow of pulp is usually the same all over the width and they run for a week without any attendance. Care must be taken to stir the residue well and wash it well out with water before the rifflers are cleaned, in order not to lose any good fibre. These

rifflers need, however, a much stronger support than the ordinary rifflers as their contents of water and pulp is several times as heavy as that of the ordinary rifflers.

The Screens.

There are two distinct kinds of screens, the coarse screen and the fine screen.

Coarse screens are either flat shaking screens with perforation of round holes of $\frac{3}{8}$ to $\frac{1}{2}$ in. diameter, or slowly rotating drums with the same perforation, or perforated with oblong holes 1 to $1\frac{1}{2}$ ins long and $\frac{1}{2}$ to $\frac{3}{4}$ in. wide, often arranged in the direction of the flow of the pulp in the rotating screen cylinder. They serve to take away knots and large slivers which otherwise would go on the fine screens and to some extent be broken up there. Care should be taken that the coarse screens are provided with strong shower pipes, and that the pulp is properly diluted with water, about 125 parts of water to one part of pulp, in order to make sure that no good fibres stick to the knots and slivers and escape with them.

Fine screens have been built on many different principles shaking, gravitation, water shock, suction, and centrifugal forces, but up till now a perfect pulp screen has not been devised. For the present the flat diaphragm suction and the centrifugal screens are dominating in sulphite pulp manufacture. For easy bleaching as well as for ordinary "quick cooked" pulp, the diaphragm screens are much to be preferred in spite of all their disadvantages, as they will sort out the larger part of slivers which in the cooking process have been softened, but not cooked enough to make the fibres separate in the blowing of the digester. In a centrifugal screen, these slivers will bend through the holes in the plates and follow the pulp. For strong pulp where the slivers are not cooked soft but remain in the unscreened pulp as stiff bundles of fibres, the centrifugal screen is much to be preferred.

The diaphragm screens are not cheap in first cost, if efficiency is taken into consideration. They need large space, are expensive in upkeep as to knockers and diaphragms, and the recutting of the plates is rather expensive.

Diaphragm screens should be arranged in rows of 4 to 8 with screen plates, horizontal or slightly inclined, in order to force the pulp to flow from screen to screen. Four screens can easily be coupled together and driven by one pulley, and even eight screens can be driven by one pulley if this is placed in the middle of the row. The pulp should be diluted to about 150 parts of water to one part of screened bone dry pulp. The pulp should run in on the first screen gently, not dumped down, in which case some of the slivers will be forced through the plates; nor rushed on the screens, when the efficiency of the first part of the first screen becomes nearly nil. The pulp on each screen should be circulated by means of spray pipes, or streams of water coming through flattened pipes, the current working nearly parallel with the screen plates, so arranged, however,

that it helps the flow of the pulp from screen to screen. The pump outlet from underneath the screens should be so arranged that the level of the outflow can be regulated in order to make it possible to get the largest possible quantity of properly screened pulp from the screens.

Spouts leading the pulp from the screens should be as high as the frame of the screen to prevent an overflow in case the escape of pulp is diminished or stopped. The screen plates are cut according to the kind of pulp made, from No. 8 (0.008 in.) to No. 16. No. 8 to 11, are the usual cuts for bleachable pulp, No. 11 to 13 for quick cooked pulp, and No. 14 to 16 for strong pulp. Most European mills, where the chips are as a rule more carefully prepared, and the cooking is conducted more carefully, and where consequently the pulp contains less slivers, use screen plates as coarse as No. 14 for bleachable pulp.

In mills where several rows of screens are in use, the best way to get rid of the screenings is to place one screen at the end of the rows and lower than the rest, to which all the screenings are run. This screen should be provided with screen plates one to two numbers finer in cut than the plates for the rest of the screens, or at least new plates of the ordinary cut put on here first, before they go to the other screens. This lower screen should from time to time be shut off from the rest, extra water admitted, and run until the screenings are free from fibre, when water is shut off, pulp outflow levels lowered, and the screenings discharged to bin or truck, or direct to refiner, by removing one end of the screen frame and hosing the screenings out or by removing them with a wooden shovel.

Centrifugal screens are cheap in first cost, take small space, and are cheap in upkeep, even with regard to screen plates, but they take more power than the flat screens, about one and a half H.P., and one H.P., respectively per ton of air dry pulp in 24 hours. As before mentioned, they do not screen soft pulp as well as do diaphragm screens, but are the best screens for hard pulp. The types of centrifugal screens which collect the screenings, and throw them with a new supply of water against special finer perforated screen plates, are to be preferred, as they let the screenings out from the screens practically free from good fibres. The pulp should leave the screens diluted to from 275 to 325 parts of water to one part of pulp. Care should be taken that not too much pulp is admitted, in which case the screenings will carry away a considerable quantity of good fibres. Perforations used are round holes No. 50 to 65.

Screen plates, cut as flat screen plates with slots, have been proved to lower the output of the centrifugal screens to such an extent as to make them far from economical.

The screen room should preferably be arranged so that the pulp which rises from the blow pits goes to agitator chests, located below the screens, which can receive the pulp that may flow over from screens, or any other overflow in the screen room. From the chests the pulp should be pumped to the riffles from above it. Here by gravity, to coarse screens, fine screens and diaphragm chests in the machine room.

If lower screens the pulp is not blown into blow pits, but dropped or poured into open washing tanks, the pulp should be treated similarly to coarse screens, fine screens and diaphragm chests. The disintegrator usually consists of a rotating shaft or wooden drum, with a three-pronged shaft, the shaft as well as the drum

being provided with square pegs of ample size, between which the pulp is kneaded. These pegs should be so arranged that they work the pulp through the drum. Very little water should be admitted to the drum in order to get the pulp thoroughly kneaded, and only at the outlet end of the drum should water be admitted to wash the pulp to the riffles.

The capacity of the different machines in a screen room depends very much on the quality of pulp made. Disintegrators can and should be built to take the whole capacity of the mill, as this makes transportation arrangements for the semi-dry pulp cheaper. The size of the riffles depends on the quantity and fineness of the materials that have to be separated out. The width for ordinary riffles should not be less than 6 inches for each ton daily production, and the length should not be less than 30 ft.

Coarse screens are built up to a capacity of 30 tons in 24 hours. Twelve-plate 12 x 43 ins. diaphragm screens have a capacity of about four tons. Centrifugal screens are built in standard sizes for capacities up to 25 tons. The stock should be run into the stock chests in the machine room as thick as possible, and pulp thickeners should be used, particularly where centrifugal screens are installed.

The stock chest should be large enough to keep the department it feeds running for at least one hour, even if the previous department for some reason is shut down. Modern European mills often have stock chests large enough to feed their machines for as long as four hours.

The Machine Room.

As stated above, agitator chests should be provided large enough to keep the machine room running for an hour or more. The whole production of the mill is often dependent on the machine room, and it is cheaper, in first cost as well as in cost of labor, to have large agitator chests, than to have spare machines. The machines in the machine-room depend entirely on how the pulp is disposed of, whether used in own adjoining paper mill or shipped, and in the latter case whether sent to near-by mills or shipped long distances.

Gauging the Supply of Pulp.

Where the pulp is used in an adjoining paper mill, and the beater charge is mainly sulphite pulp, a large proportion of this pulp can be pumped direct from the agitator chests to the beaters. In this case the pulp should be thickened before it reaches the agitator chests, and preferably also between the agitator chest and the stock pump, to make it possible to pump as much as possible of the pulp. Where pure sulphite paper is made about 90 per cent of the stock should be pumped to the beaters.

For thickening the pulp between the agitator chests and the stock pump, pulp thickeners with false bottoms should be used, the false bottoms narrowing up against the cylinder mould from say ten inches at the inflow of the pulp to from two to three inches at the place where the thickened pulp overflows from the thickener; from here the pulp should flow to a small conical chest or agitator chest serving the stock pump. It is very difficult to determine with any degree of accuracy the amount of pulp pumped, in order to determine the yield in the sulphite mill, though several arrangements for this are in use.

The most reliable seems to be an arrangement with two measuring tanks so arranged that when one is filled it tips over and the other receives the pulp. From

these tanks samples should from time to time be taken. An automatic counter should determine the number of tanks tipped for pumping.

The Product of the Wet Machine.

Ordinary wet machines should be used to take up the pulp for thickening the beaters. These wet machines should be provided with steel size rolls, preferably case hardened, and a scraper and inclined board should be provided to scrape off and conduct the pulp to the tanks; this latter to save labor, as one man can attend to four or even more machines. When the pulp has to be stored it should be cut off from the wet machines in laps, as they are easier to handle and give less loss in storage.

The lap from an ordinary wet machine contains about 33 per cent of air dry pulp, and where the pulp has to be shipped for a considerable distance, other machines have to be used to make the pulp fit for shipping. The laps can be pressed in a strong hydraulic press, say with 600 to 800 tons total pressure on the ram, and the laps pressed to up to 60 per cent air dry, but these laps give trouble in the breaking up in the beaters, and the fibre loses some of its strength in the breaking up.

It is therefore better and at the same time it saves labor to use hydraulic wet machines, though these have many disadvantages.

The ordinary kind of hydraulic wet machines give laps of from 40 to 50 per cent air dry pulp, depending on the machines as well as the temperature of pulp and water. The warmer the better; a good machine should not give less than 43 per cent in winter and 45 per cent in summer.

In cases where the pulp has to be sent long distances it will often prove cheaper to run the pulp over drying machines, but the fibre not only loses strength in the breaking up of the dry sheets in the beater, but is also to some extent burnt by the heat in the drying cylinders, specially if considerable steam pressure is used on the dryers, and these are of large diameter.

Wet Machine Equipment.

Wet machines should be provided with cylinder moulds of large diameter, not less than three and one-half feet and preferably four feet or more. The cylinder mould frame is always made of acid resisting metal usually wound with copper wire of say 3-32 inches diameter, and with phosphor bronze wire cover of about No. 40 where the white water is well utilized, where this is not the case No. 60 or even No. 70 should be used, but this lessens the output of the machine to a very large degree. Some times in order to lessen the strain on the top wire, a coarse phosphor bronze wire made of half round wire is applied between the copper wire and the top wire.

The machine vat should be provided with a false bottom which brings the pulp against the part of the cylinder mould going down into the pulp. Some water should be admitted in the opposite side of the trough, to prevent accumulation of pulp there, and should at the same time serve to dilute the pulp to suitable thickness.

There should be a strong spray pipe on the free part of the cylinder mould and to clean the wire a steam hose connection should be at hand, but care should be taken not to apply the steam jet through the pulp, this will blow pulp into the wire, and entirely spoil the wire cloth, as there are no means of dissolving

the fibre blown into the wire. The packing at the ends of the cylinder moulds should be kept tight. The couch roll should preferably be covered with a rather heavy jacket, but can also be covered with old wet felts. The cover should neither be too thin nor too thick, and should be regulated to suit the pressure necessary on the couch roll catching the pulp. Too much pressure will spoil the wire cloth in a short time. The couch roll should be absolutely parallel with the axis of the cylinder mould, and placed somewhat behind the center of the mould. A considerably larger production can be obtained on the machine if the felt is so arranged that it to some extent presses the pulp couch roll. This will allow a thicker sheet to pass the couch roll without crushing it.

If the machine suddenly stops, shut off the pulp and discharge most of the pulp in the trough by an opening underneath the false bottom with the water on to dilute the pulp.

Start the machine with a small amount of pulp and put on more successively until the proper thickness of the sheet is obtained. Regulate the water according to the flow of pulp, too low a level in the trough is just as bad as one too high.

Suction boxes for felts are usually made of coarse grained hard wood, perforated with round holes and applied on a wrought iron suction pipe. These suction boxes, however, wear the felt quickly, and should be made of fine grained hard wood, for instance, mahogany, or still better entirely of copper, arranged with two rows of square holes so set that every part of the pulp passes the suction. The leading rolls on each side of the suction boxes should be so placed that the felt only presses slightly against the box, and the box should preferably be slightly rounded and the corners taken off. For the same reason the felt washers should be made of copper pipes rather than hard wood, and the felt should be well watered by means of spray pipes on both sides before it reaches the washer. The felt wringer should preferably consist of two rubber covered iron rolls as they will squeeze out the water with less pressure than wooden or iron rolls, and will consequently save the felts. The felt stretching rolls should not consist of wooden rolls with spirals of old felt or similar materials, as these spirals very quickly wear and spoil the felts, but should consist of copper rolls with half round copper spirals soldered on the rolls.

Hydraulic wet machines should preferably be provided with a one-piece fine grained hard wood press roll, but can also be provided with an iron roll covered with small pieces of hard wood placed on the end. These latter rolls, though cheaper, are very much harder on the felts. It is also harder to cut the pulp from these rolls and they do not produce as dry a pulp as the solid wooden rolls.

The hydraulic pressure to obtain the dryness of the pulp varies with the construction of the machine. It is usually 40 to 60 lbs. per sq. in.

To save the felts this pressure should be kept nearly constant by means of an accumulator, and where several machines are installed, one pressure pump for the whole lot with a spare pump and accumulator should be used, as this is more reliable and cheaper in first cost. The lower press rolls on hydraulic wet machines should preferably be covered with hard rubber in order to save the felts.

Wet machines should be so set up that the pulp which necessarily collects under the machine should

not come in contact with grease and dirt from the bearings and other parts of the machines; this in order to be able to send it to the white water tank and thus prevent it from going to waste.

Requirements in a Dry Machine.

A dry machine should be just as carefully arranged as a paper machine as to evenness of speed, flow and consistency of pulp. The consistency of the pulp in the agitator chest should be kept as even as possible. The pulp should, before it goes to the service box in front of the machine, pass through an automatic service box arranged with float connected to inlet valve, to secure an even level of the pulp and consequently an even flow. Where the agitator chest is located above the machine the pulp should be admitted direct to the automatic service box, but where the pulp is pumped from the chests there should be an overflow service box as well, with overflow back to the chest. The two or three service boxes can be built in one structure. The service box in front of the wire should be so arranged that the pulp flows on the wire slowly, and in an even thickness, and there should be arrangements to dilute the pulp here in a way that it reaches the wire well mixed with the water.

The wire should never be less than fifteen yards in length and No. 40 mesh or still better No. 24 double drilled. It is needless to say that there should be every convenience to change the wire and felts quickly.

There should preferably be three wet presses each arranged with double lever arrangements to get sufficient pressure. At the third, and preferably also at the second press, felts woven of coarse hard twined wool should be used, they will stand more wear and tear, will press the pulp dryer, and will give large felt marks in the pulp. The pulp should be run through the third press in the opposite direction in order to get felt marks on both sides of the sheet. These felt marks will collect steam, and thus make it easier for the steam to escape from the pulp, during the drying process, and less fibre will be weakened by too great heat when in direct contact with the drying cylinders. The process should be so strongly built and the counter weights on the levers so heavy that the pulp leaves the third press 42 to 45 per cent dry.

The Drying Cylinders.

The drying cylinders should preferably not be over five feet in diameter, specially for the latter part of the system, as the pulp needs some airing not to get burnt. The steam pressure in the drying cylinders should preferably not exceed five pounds and should never exceed thirty pounds for the latter part of the dryers not twenty pounds, in order not to burn the fibres too much. The drying surface of each drying cylinder should be utilized to its utmost capacity by means of two leading rolls for each drying cylinder.

To get the largest possible output from the machines the flow of pulp should be regulated, not the steam pressure, which only should be kept inside a minimum limit by means of a safety valve. Care should be taken that the drying cylinders are freed from water as far as possible, in order to utilize the drying surface to the largest possible extent, as the steam coming off its coat more readily than does the condensed

The very best steam trap is, where it can be conveniently set up, the old style trap consisting of a vertical iron pipe with an internal closed copper pipe connected to the outlet valve for the condensed steam, but there should be a large difference in diameter of the pipes, so that the inner copper pipe is affected by the hotter steam in order to close the bottom valve connected to it long before the steam has pressed all the water out of the traps, or a lot of steam is liable to escape with the water. The width of the sheet on the wire should be so wide that it nearly covers the whole width of the drying cylinders, and the ends of the drying cylinders should be well insulated in order to save steam.

Where exhaust steam is available, this should be used for drying the pulp, and when the mill is driven by steam it will often prove a good scheme to dry the pulp; even in cases where the cost of freight is not very high, as the additional cost of instalment of the engine plant and the drying machine is not very high and the increased consumption of steam is only a small per cent.

It is preferable to run the pulp from the machine, with from 15 to 20 per cent of moisture, rather than air dry or dryer, as the fibres get more weakened by the heat from the cylinders the nearer they come to absolute dryness.

Preparations for Shipping.

Where the pulp is going to be shipped by rail it is preferable to roll it, as this takes less labor and still more lightens the work of the furnishing of the boats in the paper mill, but where the pulp has to be shipped by boat, where bulk must be considered, it will have to be cut in sheets and baled.

The best baling presses are hydraulic presses with ample accumulators attached to the press pumps, in order to get the pressure up quickly. Automatic scales should be arranged on the press to avoid a double handling of the pulp. In selling sulphite pulp it is of very great importance to check the weight and dryness of the pulp leaving the mill. All customers will complain if they get under weight, but very few will say anything if they get too much pulp, and even a fraction of one per cent makes a large difference on the profit. All scales should be kept in perfect condition.

As to capacity, wet machines with ample dimensioned moulds should give 500 to 600 lbs. air dry pulp per inch working width in 24 hours. Drying machines produce from 600 to 900 lbs. per inch working width in 24 hours; the most economical output as to steam consumption is about 800 lbs. One well arranged baling press taking three bales of 200 lbs. at a time, can handle up to 30 tons in 24 hours.

Screenings.

The screenings in a sulphite mill vary between 3 per cent and 8 per cent of the pulp produced, the quantity depending on the kind of pulp made, the quality of the wood and the evenness of the chips, and on the cooking. High quality bleachable pulp gives the lowest quantity, low grade strong pulp the highest quantity of screenings.

The right utilization of these screenings is of importance, as they are a waste, and consequently prices obtained are a net profit with the exception of the labor costs.

There are four kinds of screenings utilized:

Refuse from rippers, refuse from coarse screens, refuse from fine screens, and refuse from extra fine

steam traps, so that do not waste any considerable quantity of steam, could be provided for every drying cylinder, separately, or for small series of cylinders.

screens, where two sets of screens one after the other are in use.

This last pulp, after disintegration has, to the author's knowledge, been offered here in Canada as a suitable sulphite for news print, but though unsuitable for this purpose, it is quite good enough for making medium grades of wrapping paper.

The other three kinds of screenings can either be run separately or mixed through the refining machines.

The Wahlstrom refiner has proved to be a suitable refiner for all kinds of sulphite screenings, and they can be run together, only the refuse from the riffles has to be run over a small sand trap, to prevent stones from the digester lining and other heavy particles from going through the refiner.

The best way to install a Wahlstrom refiner is to have a conveyor carrying the different kinds of screenings to the inlet trough, the screenings being much as possible freed from water.

The pulp from the refiner is mixed with sufficient water and run through centrifugal screens of say No. 40 perforation. The pulp going through the screen is run over a special wet machine, or thickened, and collected in an agitator chest, from where it is run over the wet machine or the drying machines at convenient intervals, preferably just before the cleaning out of chests, etc.

Refining Screenings.

The screenings from the above mentioned screens are once more conducted by an elevator to the main conveyor supplying the refiner. It is not a bad idea to arrange a small sand trap between the refiner and the screen. Screenings can also be refined in kollergangs, or in beaters, provided with basalt lava rolls and bed plates. In both cases it is essential to remove the sand and stones before the screenings go to these machines, and in order to save power and fibre to charge the different kinds of screenings separately. Wahlstrom refiners take more power than the other refining systems, but are cheaper in first cost, and one man can run a plant sufficient for up to five tons in 24 hours.

Kollergangs cost more in installation, and take more attendance, but cost less in upkeep. With basalt lava beaters it is possible to beat the screenings to a desired quality, but they need much attendance and a lot of upkeep.

Boiler Room and the Steam Raising.

Next to the wood room the steam plant is the most important part of a sulphite pulp mill from an economical point of view. Nevertheless it is often neglected, and often left in charge of men who do not even know the elementary theories of steam raising. Also the design is often left in the hands of men with insufficient knowledge.

The Lancashire boiler is undoubtedly the most suitable boiler for a sulphite mill, as its large water room makes it possible to vary the quantities of steam raised considerably, without too much waste of fuel. This type of boiler is, however, expensive, and so is its setting. The next best is the tubular boiler. The water tube boiler is cheapest in first cost, but should only be used in very large mills where the steam consumption is fairly even (sulphite pulp mill on the same steam main as paper and other mills), and where steam is the motive power.

All boilers should be set so that the combustion gases have few or no sharp turns or corners to pass, and the gases should, if possible, not be lead down-

wards, as this prevents the draught to a very large extent. The flames from the fuel should as much as possible be directed against the surface of the boiler, and for Lancashire and tubular boilers the setting should be a three way one, i.e., the gases should pass over the steam room of the boiler before they leave it, thus drying the steam.

Economisers preferably of the counter current type should always be employed. In plants where economisers are not used, the boilers are forced, and where there is sufficient draught available, an economiser can save as much as 25 per cent of the coal bill. In planning a new mill, the earning power of the economiser should not only be figured on the fuel saved, but also on the lower cost of boiler installation, as the heating surface of the boilers can be better utilized where an economiser is installed, and consequently the heating surface can be reduced.

The combustion gases should, for a plant without economisers, leave the boiler at a temperature not exceeding 450 deg. F., this in order not to waste too much of the heat; where an economiser of proper size is used, the gases can leave the boiler at a temperature of 600 deg. to 700 deg. F., the economiser utilizing most of the heat left, bringing the temperature of the escaping gases to about 300 deg. F.

The gases should contain at least 10 per cent, but never over 16 per cent of carbon dioxide (CO_2). Where automatic stokers are used, the per cent of CO_2 can be kept steadily about 14 per cent, but by hand firing the percentage will vary a great deal. If the percentage of CO_2 is low, there is a surplus of unnecessary air in the gases, which is heated, and carries off a large amount of heat; when the percentage is too high, the combustion is incomplete, part of the fuel being converted into monoxide (CO) instead of CO_2 with an immense loss of combustion heat.

Automatic stokers should preferably be used, but of a design which allows for a large variation of the quantities of steam raised. An insufficient and uneconomical boiler plant has more than once proved to endanger the existence of sulphite mills, and an ample supply of steam, power, and water, are the most essential points for successful operation.

Without these in abundance, there is no possibility of showing good results, however well the rest of the mill is running and economies are looked after.

A NEW DIRECTORY.

The second English (1913) edition of "Paper and Pulp Makers' Directory of Sweden, Norway, Denmark and Finland," edited and printed by Hugo Brusewitz, Gothenburg, Sweden, contains the essential points of interest to manufacturers of three hundred and seventy-five mills, manufacturing paper, cellulose, board and wood pulp in the Scandinavian countries. Reproductions of the watermarks employed by the paper manufacturers, and an excellent map in colors, showing the distribution of the mills, add materially to the usefulness of this excellent publication.

Price Bros. of Jonquiere, Que., have opened up a permanent office in Toronto at room 712 in the Traders Bank Building, with John Hewitt, Jr., in charge.

W. J. Milford of the Winnipeg Paper Co., Winnipeg, intends opening a branch plant in Edmonton. Boxes of all kinds will be made and the plant will employ about fifty hands.

ESTABLISHING A PAPER MILL

By **DAN J. ALBERTSON**, Consulting Engineer, Kalamazoo, Mich.

The building of a new mill occurs but once or twice in the life of the average manager or superintendent, and to the man who has passed through and probably will not pass that way again, matters of construction will have but a passing interest. To the men who contemplate as nearly all assistant managers and superintendents do of "building a mill of their own," therefore, the article must be of value if to anyone.

This article will therefore cover other matters of probable interest to them in connection with the building and conclusions the writer has arrived at, an experience covering a considerable period of time both in the engineering and business end and association with some of the most able managers and paper makers of the period.

Organization

One of the first matters that is considered is—"who is going with you?" In the operating end congeniality is of great importance. The manager must manage and the superintendent superintend if you would avoid the petty jealousy and bickerings that so soon disrupt any organization in which they are present. An important item of the organization that is many times overlooked is the financial backing. This is as important as the paper machine. The fact that you have able men in operating and executive departments and money to build is not always sufficient. You require some banking or strong financial institution with established credit to lend stability to the young and untried company. Build up an organization. Do not be a one-man concern.

Location.

The location of the mill is an important step. Various municipalities offer alluring inducements by way of free sites and bounties. Beware, and consider well the location of a mill remote from paper making centres. An isolated plant has many handicaps that off-set natural advantages and inducements. Mills are not dependent upon local markets for raw stock or markets and are not competitors in the usual sense. On the contrary, the centralization of labor for mills is an advantage to all. Better locate in the midst of competition than alone with a limited market for your output.

Building

The question of building is governed, like many other items, by conditions. Some of the most successful companies have started in mills of the cheapest construction. It is this fact to which they owe their existence in part. Mill construction has made rapid advances in cost as well as methods during the past fifteen years. The development of the cement industry is accountable for this to a great extent. A combination of mill and construction appears to the writer to be best adapted, considered from all points. For stock, both raw and finished, finishing and all dry parts the timber construction has more points in its favor. First, it costs less, there is very little difference in the cost of masonry and timber if the risk is sprinkled, as the risk is, on the contracts rather than on the building. It is shorter and more flexible and adapted to changes. Nothing has yet been devised that will entirely prevent dust and fire particles, arising up from the surface of concrete floors and causing annoyance.

In my next article I would advise reinforced concrete.

This has advantages over the old combination of structural steel and concrete. In most places the beam method of construction has advantages over the mushroom or slab system, principally in the fact that the beams can be located underneath bearing points of machinery and each designed independent of the other for the load to be carried, the intervening space on which the load carried is usually light and can be flat floor slab of the thickness required. On large open spacing with light loads uniformly distributed the "mushroom system" has slightly the advantage in cost and appearance. The tile and concrete method is hardly adapted to paper mill use except in special cases.

Reinforced concrete has reached a point when the principles and design is understood by all up-to-date engineers and deformed reinforcing rods are rolled by all steel mills and sell in the open market at prices near the price of structural steel of same weight. With this standardizing of the construction it is not necessary to accept the alluring offers of the salesman with the "best" or "only correct system," who offers free plans and less material than any other, who will sell the reinforcing at "market" prices. This looks like easy money on the face, but in practice there are several drawbacks. You will get the plans usually well designed but without regard to anything except the safe-load. All the salesman-engineer is interested in is the sale of reinforcing. When the machinery is located and you will find a pipe running down through a beam or a belt through a column and have heard the sound of hammers and other tools of iron accompanied by cuss words(of user, not you) through the mill while these holes are being cut, it will not look as much like something for nothing.

Reinforced concrete under ordinary conditions and price will cost from 25 to 50 per cent. more than slow-burning construction, statements of the system salesman of the equal cost notwithstanding.

Power Plant

The power plant is one of the most important and misused parts of the mill and is many times carried to extremes, sometimes one way, sometimes another. It is safe to say that more money is lost or saved in the power plant than any other department of the mill. The superintendent being a paper maker, cannot be expected to be posted on the design and requirements. A knowledge of the requirements of a paper mill is essential to the intelligent design of the power plant. There are many eminent engineers whose practice is in installations, so large and complicated as not to be familiar with what is needed. On the other hand, there are efficiency engineers and power plant quacks who load up a plant, new or old, with a dozen or so of special appliances and frills, each guaranteed to save from 5 to 15 per cent. of the total cost of operation.

What is needed is a plant devoid of "frills," that will give continuous service and cause no trouble or shut-downs.

The question of mechanical and electrical transmission is one of the first problems to confront the designer. The arrangement of the mill sometimes settles this for him. The greatest economy of electric transmission is in intermittent service, outlying installations and direct connected units and ability to measure the power consumed. There is no disputing the fact that

electric machinery is more complicated and expensive and requires more attention than mechanical equipment, or to reverse the comparison, if electrical equipment is given the same neglect that mechanical is, the results and economies would not be up to the same. From this analysis it would seem that if the arrangement of the mill will admit the driving of a line shaft like the beater line located on piers in the basement by a rope drive and from this shaft to machinery running continuously at full load it will be efficient run-cause no trouble. It would also indicate that machinery located in remote parts of the mill can better run by motors either individually if large or in groups if small.

The question of an alternating or direct current is a matter open to discussion. The generating unit is the item that first influences this. The advantages of the direct current are the variable speed features for different purposes, including the paper machine and that the slower speeds are more flexible and better adapted to paper mill machinery. The commutator trouble and upkeep are against this style in comparison to alternating current. It is only adapted to very short transmission. The alternating current is adapted to long transmission and higher voltage. The upkeep is less and the motors cause less trouble. They are popularly alluded to as "fool proof" or "simple as a saw buck," which is not true. As a class the speed is higher. They inherit power factor trouble which, while it does not affect the motor or running, necessitates greater outlay in generating investment. Motors of this class should not be run continuously underloaded for this reason.

This brings me back to the prime movers or steam engines. I will discuss the producer gas plant briefly by mentioning that gas engines have reached a higher point of design and efficiency than the producers. In the use of soft coal in producers it necessitates scrubbers and purifiers that lead to complications, and while the producer gas plant in theory is a very efficient equipment, still, at the present time, considering the amount of steam used in paper mills and allowing for the hot water from jackets of gas engines, it ought to be gone into very carefully before even considering the installation. Oil engines may be disposed of almost as briefly. The recent high price of oil has effected these installations seriously. There is no question regarding the extreme high efficiency of these engines or their adaptability as auxiliaries. One of the serious items is the upkeep and tinkering required. The cost of the foreign engines much exceed the domestic machines and it is questionable whether the domestic engines can compete with them in quality owing to the higher cost of American skilled labor. The use of steam in paper mills is also an item effecting these engines.

This brings me back to the old stand-bys, the steam engine, either in the simple, compound or turbine types. The turbine is best suited for large installations of the alternating current type, and it is not efficient except running condensing with high vacuum. The taking of steam from between the stages is advocated by some and figures out well, but in practice is open to discussion. High initial pressure and super-heat aid the efficiency of the type. It is only adapted to direct connected generators. It is very economical as to space required. In comparing the steam consumption with reciprocating engines, care should be taken to see that the steam consumed by the auxiliaries is included, as these are usually steam driven and very inefficient.

To take up the other type, the simple engine should be installed up to the limit of the continuous consumption of the exhaust steam. A simple engine is very inefficient from a thermal standpoint. The number of B. T. U.'s extracted is very small and consequently the steam less the radiating losses in the cylinders, etc., is practically as good after leaving the engine as the same amount taken from the boiler. The proportioning of this unit is governed by the individual conditions either a unit driving a generator for the electric equipment, or a variable speed engine for paper machine, or both. There is no economy in steam pressure in this engine exceeding 100 pounds. This leaves but one type left, the cross compound condensing, or in board mills the twin cylinder or non condensing type when using exhaust steam. This can be either mechanical or direct connected electric, as the case may be. The initial steam pressure will be between 150 and 175 pounds. The vacuum should not exceed 26 inches, as the economy of the engine is not increased in proportion to the cost beyond this. The speed of this should be from 85 to 100 R. P. M. for Corliss type. Other types of engines are modifications of the above and need not be discussed.

From an analysis of the above it would appear that for an electric plant, considering cost, etc., a turbo-generator, with variable speed reciprocating engine for paper machine. For a direct connected mechanical electrical plant, a cross compound condensing engine driving line shaft by rope drive, with twin or quadruple cylinder variable speed engine for paper machine, suitable engine driven or belted generator as the size of plant required.

Regarding the boiler plant, standard water tube boilers are to be preferred. There are several on the market. When the total operating horse-power reaches near 1,000 horse power or above, automatic furnaces should be installed. In installing furnaces the kind of coal, whether of the coking, semi-coking, or free burning coal should be considered. This item is the rock on which breaks the reputation of stokers many times where one owner will say they are good and another bad.

As the plant increases in size coal and ash handling devices should be considered. In the small or medium plant the man with the wheel barrow is the cheapest investment. Ash handling should not be attempted with bucket conveyors, as the upkeep is very great. This type is satisfactory for coal handling of moderate size and the coal lubricates rather than wears the joints. Where large storage and great capacity is desired, the grab-bucket, bridge crane, telford and mono-rail or locomotive boom will reach the limit.

Economizers aid the efficiency of the plant in coal consumption. Super-heaters increase the theoretical efficiency of the engines by the delivery of dry steam. For reciprocating engines the super-heat should be below 100 degrees. When built into the boilers they detract slightly from the efficiency of the boilers. These may be included as "frills" or items that perhaps show slight net returns after the investment is considered and the risk of them not being run as de-

Equipment

The equipment of a mill depends so much on the product that but little by way of suggestions can be offered. The principal caution would be to arrange that the units should be harmonious as to size and not compel the over-working of any particular part. Few if any machines are more efficient either in output or power by over-loading.

Layout and Design

In designing and laying out a mill the plan is sometimes influenced either by the size and shape of the site or by an original plant. In case there are no handicaps of this nature, the arrangement will depend on the incoming railroad sidings, care being taken to provide for incoming and outgoing stock and coal. With a combination of mechanical electrical or all electrical power, the arrangements of departments are flexible only having in mind the ruling or inexorable law that all stock should follow a continuous route and should not retrace over any part of its passage from the time of entering the stock house to the loading out at the

other end. Also that all material like clay and size used in the process should be made and supplied at the psychological moment and in proper sequence without being brought from some remote place conflicting with the routine passage of product.

It is advisable to place the beater room at right angles to machine room, with power plant centrally located for short transmissions of steam and power. In case of mechanical power the engine room should adjoin the beater room. The placing of engines in basements of other rooms in a mechanically driven plant is not to be commended as a general proposition, although sometimes necessary.—Paper Trade Journal.

THOUGHTS ON PAPER DRYING

By JOHN W. BRASSINGTON.

The comparative lack of knowledge of the details of the operation of drying paper on a paper machine makes this subject one of absorbing interest to anyone desirous of improving the art of Paper Making. There is, generally speaking, comparatively little attention paid in the design of a paper mill, to the advisability of making special arrangements so that the dryers will be provided with an ample steam supply at every dryer, with an abundance of dry air and with an efficient water-discharge system. It is probable that this apparent indifference to what is, as a matter of fact, of prime importance, is largely due to the prevalent ignorance as to the amount of water that is evaporated from the paper at each dryer, as the paper passes on its journey from the presses to the reel. Ignorance of the percentage of the total drying work that is done by each dryer argues an equal lack of knowledge of the amount of steam that must be supplied to each dryer in order that it may be enabled to do its allotted share.

It is not convenient or practicable for the average mill to lose time and output by making experiments in order to obtain information as to the consumption of steam by each dryer. Such experiments must, of necessity, be expensive and costly in both time and money, and the advantages that might be obtained by making them are not very evident to the average paper maker. It is, however, more than probable that the efficiency and capacity of every paper machine might be considerably improved could we be certain of the best method of distributing the steam supply in a nest of dryers.

It is possible that the reading of this article may create the interest of someone who will make an effort to obtain definite information on this subject, a suggestion to some vital minds is equivalent to action, should they approve of the idea advanced for their consideration.

The steam header, that supplies the steam to the various dryers generally, is furnished with exhaust steam from the engine driving the paper machine. It may further be supplied, if necessary, with an automatically controlled supply of high pressure steam from the boilers. The amount of steam to the main header could be increased into it at either the calendar or at the press end of the header, or it could be furnished at one or more intermediate points. Again, the steam header could be divided into sections each with its

individual supply of steam, in such a manner as to maintain a pre-determined and separate pressure in each section, proper pressure relief valves being installed so as to relieve the atmosphere or to any adjacent section subjected to a lower working steam pressure.

If the steam is supplied at the calendar end of the steam header, then it is evident that the highest pressure and temperature would be maintained in the last dryer at the calendar end, while the lowest pressure and temperature would be maintained at the first dryer at the press end. This method may be calculated to secure a high degree of economy of steam, even if a corresponding loss in the capacity of the dry part be the result of its adoption. The entrance of live steam at the calendar end of the steam header has the disadvantage of keeping the dryers at this end too hot, in order to obtain a sufficient supply of steam to satisfy the demands of the header as a whole. It is axiomatic that wet paper cannot be injured by high temperature end, without injuring the paper, and for this reason, until it is deprived of its protective moisture; it is, therefore, possible to maintain a higher pressure of steam, and therefore, a higher temperature at the press end of the dryer nest, as compared with the calendar it is at first sight advisable to make the steam enter the dryer header at the press end.

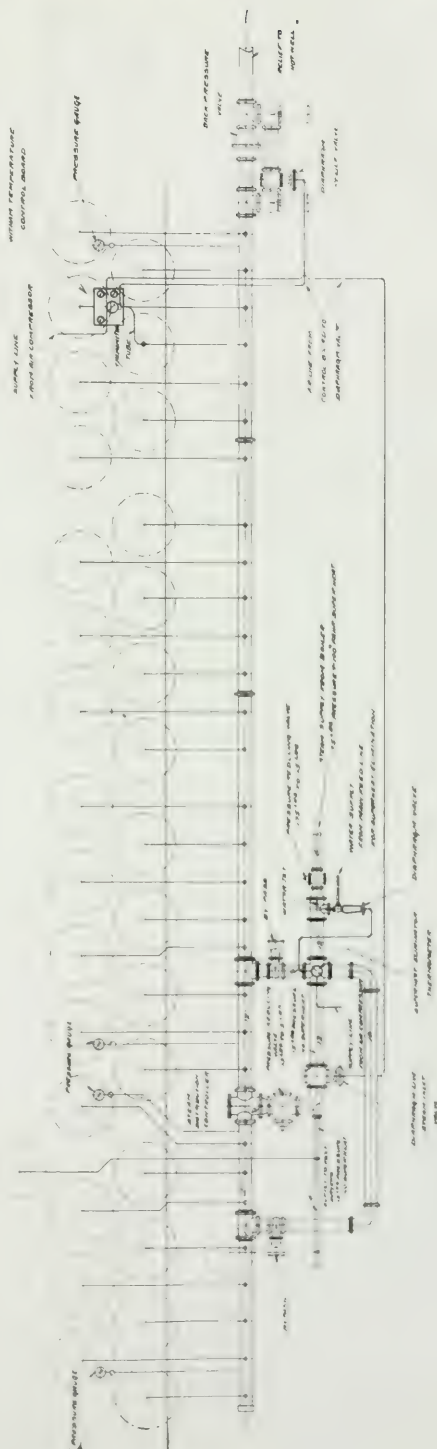
Now it is one of the laws of heat transference that the amount of heat passing from one body to another in any unit of time, is directly proportional to the difference in temperature that exists between the two bodies during that unit of time; it is, therefore, evident that, providing our paper contains moisture, when leaving any dryer, the quantity of efficient drying done on the paper by that particular dryer as the paper moves over it, is the greater the higher the pressure and temperature of the steam in the dryer. Moreover, the greater density of the steam, as it enters the dryers, owing to its higher pressure, permits of a larger supply of heat per unit of time. Broadly speaking, a dryer nest is the more efficient the higher the steam pressure in the dryers at the press end, and the lower the pressure and heat in the dryers at the calendar end; the drop of pressure or heat between these two points being as uniform as possible.

It is evident that if we select and install our piping so as to feed the steam in the main header at such a point between the two ends as to supply in both di-

rections an equal quantity of steam, then the size of the piping required is reduced to an economical minimum; should this arrangement be made, it were probably best from the considerations mentioned above to arrange for the introduction of any "make up" live steam that might be required at the press end so as to increase as far as possible the capacity of the drying unit. Live steam suddenly reduced to a lower temperature, has a tendency to become super-heated; for instance, steam at 150 lbs. gauge pressure contains 1195 heat units per pound; when a pound of steam at this pressure expands to a pressure of say about 5 lbs. gauge, it only requires to contain 1155 heat units to maintain the new condition; the remaining 40 heat units thus released, use their energy in super-heating this steam. As the specific heat of super-heated steam at five pounds gauge pressure is about .48, then it is evident that each pound of steam released from 150 pounds gauge pressure into a dryer header at five pounds gauge pressure, becomes super-heated about 80 deg. F. This comparatively small amount of super-heat is soon destroyed by the presence of any moisture in the steam header; but if the steam from the boilers, as is often the case, is already super-heated, it is then well to arrange for the eradication of superheat by some mechanical means. The accompanying illustration is a fair example of the care with which such a contingency is taken in hand in an up-to-date installation.

It is probable that the difference in the pressures maintained in different dryers in the same nest is very large; the demand for steam that exists in the first few dryers is probably often large enough to cause a partial vacuum in them; in some cases, if the steam pressure is high enough to keep the first dryers supplied, then the work done by them may be excessive enough to harm a heavily loaded paper. The efforts made by many drying experts to improve the efficiency of any given nest of dryers by the installation of special dippers, individual valves, individual steam traps, vacuum pumps, etc., have always met with some greater or less degree of success, because it is a rare thing to find a dryer unit that is not susceptible of improvement. Any improvement made on the average paper machine dryers that too often are suffering from plugged syphon broken dippers, poorly designed and installed piping, or miserable ventilation, that, therefore, can be made by almost any device, will naturally show very decidedly not only in the saving of steam, but also in the quality and finish of the paper. Any paper maker can probably obtain a great deal of enlightening information, if he will place pressure gauges in the steam header at different points or preferably on the water outlet pipes. While a live steam line, feeding into the header at several points, with hand controlled valves, together with valves in the steam header that are partially closed and so control the steam distribution in the header, would give the investigator an opportunity to make experiments that probably would result in not only a greater capacity, but also in a greater economy of steam, together with a better finish on the paper.

A periodic examination of the interior of the dryers, in order to keep the water-eradicating apparatus in good shape, as well as to clean out any oil that might accumulate, will more than pay for the cost of such a procedure. The use of a good design of syphon, with a reliable trap on each dryer cylinder, on a book machine, is an unbeatable arrangement, providing the apparatus is kept at all times in good working order, but even this refinement is not always perfectly successful, if the steam supply to the dryers is not ar-



ranged so that each dryer is supplied at all times with ample steam at the pressure most suitable to it in its position in the nest. Ideal drying conditions are, of course, rarely obtainable in practice, yet it is quite possible that a little care may, in many cases, help towards a partial realization of them.

On a modern high speed news machine, it is essential that dippers of efficient design be used; at a speed of 600 feet per minute, the dipper must be balanced, it must be of such a design that the influx of water will not trap steam in it; the area of the dipper outlet must equal the area of the dipper inlet at the moment of operation. With dippers in the dryers, it is probably unnecessary and possibly harmful to use a trap on each dryer, because traps are liable to work badly when receiving intermittent slugs of water. One good large trap on the water discharge pipe that serves all the dryers is generally successful with a nest of dryers supplied with dippers; the reason for the opinion here expressed, that a trap on each dryer is a good thing with a syphon installation, is that under the average conditions, with the steam header open to all the dryers, with no attempt to the intelligent control of steam distribution to each dryer, then there must be a different pressure in practically every dryer ranging from the highest pressure in some, equal to that maintained in the steam header, to a partial vacuum in those dryers that are doing the most work. As a syphon depends on the pressure on the dryer, or rather the difference between the pressure in the dryer and in the water pipe for its operation, it is evident that the presence of a steam trap may permit a dryer to get rid of its water by syphon action, when the syphon would not work should the trap be removed. The dipper action is purely mechanical and practically independent of the pressure in the dryers; therefore, it is probable that the fewer obstacles to a free discharge, the better.

Referring to the illustration, it is noteworthy that more than one pressure gauge is shown, in order to give a measure of the distribution of the steam supply; this is evidently a long step in the direction of the obtaining of definite information as to the action of a nest of dryers in a paper machine.

As the necessity for economy in operation becomes more urgent, so more attention will be paid to such problems as we have discussed in this article; it must be remembered, however, that the more complicated the apparatus becomes the greater is the skill demanded in the operation of it. Complication of apparatus brings its own troubles, and they are always multiplied if there are any parts in the mechanism that require delicate adjustment. Thermostat valves on steam traps are often put out of commission by a small flake of rust, and the machine tender, or even the superintending mechanic, rarely knows or cares whether a trap is in good condition or not.

To illustrate this great handicap under which the paper mill has to labor under, the writer is personally reminded of one case where a large and expensive ball bearing was taken apart and put together again by some first-class mechanics who afterwards piped up the automatic oil feed to the bearing with small pipe, which small pipe they forgot to clean thoroughly after cutting and fitting together. The consequence was that a few flakes of iron from the cut pipe got into the bearing and put it out of commission in a few weeks. Another bearing of similar design would run indefinitely if nothing gotway like the above occurred.

Of these, most mill owners have experimented and spent good money on vacuum systems, traps, etc., on

the dryers, only to find their money gone for nothing but a large addition to the scrap pile; such disheartening experiences are quite as often due to an apparently insignificant oversight, like an omission to clean the interior of the pipes, as they are to any failure in the original design.

In conclusion, it is well worth noting that the amount of power required to drive a nest of dryers can be increased possibly fifty per cent. if the steam joints on the dryers are made up too tight. It is, of course, necessary to make up some designs of steam joints as tight as they can be made up, in order to stop their leaking. It is certain, however, that if the mill owner found the cost of keeping such joints tight, expressed in dollars and cents, spent to supply the extra power to drive the nest of dryers under such conditions, that he would then soon cast around for a more economical design.

A DEVELOPMENT IN CEMENT PROCESS.

The Gun-crete Company has opened its new offices in the McCormick Building, Chicago. This firm specializes in Gun-crete Work for Engineering, Mining and Industrial Structures. It has at its disposal a large amount of the most modern Cement-Gun equipment and a very efficient working organization.

The Gun-crete Process is especially valuable for water and fireproofing purposes, for the encasing of steel structures, for rust and fire protection and for the lining of tanks, reservoirs and numerous other purposes. By overcoating with Gun-crete, temporary structures can be cheaply transformed into sanitary, permanent buildings.

Mr. Carl Weber, the president of the Gun-crete Company, is undoubtedly one of the best known concrete engineers in America. He is the inventor of the reinforced concrete chimney of which thousands have been built in this and foreign countries, and has designed and built a large number of other important engineering structures. He has been connected with Cement-Gun operations for some time and is considered to be one of the leading experts in this kind of work.

NEW U. S. REGULATIONS REGARDING IMPORTS

The Treasury Department at Washington made a ruling to facilitate the importation of paper at the lowest possible rate of duty.

Under the retaliatory provision of the paper schedule in the Underwood Tariff Act, regulations were drafted requiring the importer to disclose the name of the manufacturer and the place of manufacture of the paper, so that the customs officials might be able to tell whether the paper was entitled to the lower duty. In the case of an importation of paper by the Perkins-Goodwin Company, which for trade reasons did not wish to disclose the names of the manufacturers, the Treasury Department ordered that the name of the manufacturer in this and similar cases be waived.

Customs officials were directed to accept instead the affidavit of the importer as to the place of manufacture of the paper and the province of origin of the wood from which it was made.

Mr. John S. Bates, the new superintendent of the Dominion Forest Products Laboratory has arrived in Montreal, and will proceed with the plans for the institution of tests on Canadian woods.

CANADA'S FOREST RESOURCES

President of Royal Society of Canada Speaks in Montreal.

On Tuesday evening, May 26th, before a large assembly of members of the Royal Society of Canada and guests, Dr. F. D. Adams, dean of the faculty of Applied Science at McGill University, and president of the Royal Society, delivered his address as head of that body on "The National Domain in Canada and Its Proper Conservation," in the new medical building of the university. The address was comprehensive, embracing the natural resources of the Dominion—agricultural and the cattle trade—forest products, timber, pulpwood; water powers, products of the mines; fisheries and the fur trade.

Particular emphasis was laid upon the forest as a producer of wealth and a source of permanent prosperity. Dean Adams said that—

The forests of Canada were its chief source of revenue in the early days of the settlement of the country. Year by year the great rafts of timber were floated down the St. Lawrence and Ottawa rivers past Montreal and were loaded on fleets of ships at port of Quebec. Later, with the advent of railways, the same lumber was brought in immense quantities by rail to Montreal or shipped directly to its market in the United States. The following table shows the total forest products of Canada for census years, going back to the year 1871, expressed in cubic feet:

1871	1,386,122,654
1881	1,999,544,178
1891	6,955,924,616
1901	4,762,235,878
1910	2,084,000,000

Notwithstanding this continuous drain upon our forests and the tremendous losses which they have sustained by fire, the general opinion of the people of Canada, an opinion to which from time to time expression is given in the utterances of our public men, is that the great northern forests of Canada are so extensive that they are practically inexhaustible and will afford an abundant supply of timber for all future time, a supply which will not only meet our own needs, but will be amply sufficient to make good the increasing demand of the United States, due to the disappearance of its own forests, and also afford a surplus for export to Great Britain, South America, the West Indies and other countries as at the present time. A closer examination of the facts of the case obtained by investigations carried on during recent years, however, reveals a number of interesting and very important results.

Mr. Adams exhibited maps prepared by Mr. James White, the Dominion geographer, showing the sparsely wooded areas, the northern forests densely wooded, the southern forest, cleared forest, prairie, British Columbia forest and forest reservations. Then he proceeded:

It is only in these portions of the Dominion which are shown to be covered by the "southern forest," the "northern forest, densely wooded," and in British Columbia that there are forests yielding merchantable products. Furthermore, it must be noted that the "northern forest" is composed chiefly of trees of less value than the "southern forest," which has up to the present time been the chief source of the timber supplies of Eastern Canada.

A careful study of the question by the Dominion shows that so far from being exhaustless, the reserves of merchantable soft timber in the forests of Canada are only between one-quarter and one-fifth of that remaining in the forests of the United States. Of these reserves in Canada, about one-half is in the old provinces of Eastern Canada and the other half in British Columbia. The evidence goes to show that at the present rate of cutting the supply of timber will within a comparatively few years be sufficient only for the needs of the Dominion itself, leaving no surplus for export.

Effect of Cutting.

It must be borne in mind that while a large part of Canada is covered with forest, much of this is a woodland country rather than a country covered with a forest which produces considerable supplies of merchantable timber. Furthermore, the practice which has been followed of cutting out the valuable kinds of timber has left the successively poorer and inferior species of trees—"tree weeds" as they have been called—to multiply without restraint, and thus the forest gradually changes its character and deteriorates in value. Moreover, the rivers draining the northern forest flow down to Hudson's Bay, so that the logs if floated down the streams would reach that body of water instead of the St. Lawrence. With the approaching exhaustion of the reserves of standing timber, there has sprung up within the past few years a demand for pulpwood to supply which the younger and smaller trees are taken and ground up for the manufacture of paper. Fortunately this is not necessarily so fatal to the continued existence of our forests as might be supposed, for the younger trees, if properly cared for, grow in a relatively few years to the size required for pulpwood. Thus if the limits over which a company cuts its supplies are large and properly cared for, they can be made to produce a continuous supply of wood for the pulp mill. Our great water powers adjacent to the supply of raw material should make this pulp and paper industry a permanent source of wealth to the Dominion.

Dr. Adams next reviewed the work done in other countries for the maintenance of the forests and proceeded:

In all the European countries and in India the forests are owned in part by the State, in part by the municipalities or communes and in part by private persons. The forests owned by the different German states represent about 33 per cent of the total forest areas, while in Russia the Government owns 62 per cent and in Sweden 35 per cent of the forests. Speaking generally, it is found that the State-owned forests are the best, most efficient and most productive. State ownership is the most suitable owing to the long time—60 to 120 years—which is required to bring the depleted forests into a permanently productive condition, which naturally discourages private enterprise. Since most of the forests in Canada are owned by the governments, it should be a comparatively easy matter to change our present methods of dealing with our forests and replace them by much more efficient ones. Only two reasons for hesitation can be put forward—firstly, that any change may interfere with private op-

erations, and secondly, that the expense entailed would be very great.

In reply to these objections it may be said that there are now enormous areas of land which are at present standing waste, that is to say, they are either destitute of trees or growing trees which are of no value. If the governments were to secure certain of these areas and establish forests on them by following the well-known principles of forest practice worked out and proved to be so efficient and effective in every country in Europe, they would not only be establishing a profitable investment for public funds but would present to private owners a striking example of what can be accomplished by the application of knowledge of industry. We are assured by a forester of no less experience than Dr. Fernow that with the present stumpage of white pine in Canada, the cost of planting can be covered and a return of at least 4 per cent compound interest could be obtained, while other kinds of wood are fast reaching a value which would well repay the cost of reproduction. Such forests of choice pine or other woods, which are each year becoming more difficult to secure, would seventy-five years hence be of enormous value both as a source of revenue to the Government and of wood supply to the people of the country.

Forests and Streams.

But in addition to supplying timber, the forests of a country play two other very important roles, namely, that of equalizing the flow of rivers and the preservation of the land itself from being washed away in times of heavy rain. Beneath the trees of a forest a thick mantle of leaves and twigs covers the ground. These rest upon humus produced by the decay of leaves which have fallen in former years and which is very porous. This material, sheltered from the sun in the shadow of the forest, is like a sponge which is capable of absorbing several inches of rainfall, which is allowed to escape only very gradually. When, therefore, the forest cover is preserved on the gathering ground or catchment-basin of rivers, the rain falling on this forest area drains away very slowly into the brooks and streams, which tends in a very marked manner to equalize the flow of the rivers and to lessen the danger of floods.

To protect some of our more important streams of our Dominion (or provincial) governments have, on the recommendation of the Commission of Conservation, set aside certain large areas about their head waters as permanent forest reserves or national parks. The total area of the Dominion forest reserves at the present time is 35,894 square miles, and the total area of national parks in Canada is 4,114.5 square miles. In the forest reserves no land can be taken up for settlement, and the forest cover will be permanently preserved, while in the national parks the game is also preserved, so that they become sanctuaries for the wild animals of the country. One of the most important of these forest reserves is that on the eastern slopes of the Rocky Mountains in Alberta, which will not only protect the catchment areas of the rivers flowing through the great plains but will also supply timber to the future population of this great district. The action of the Government is worthy of all commendation. Other reserves should be added to those which have been already set aside, as, for instance, the tract about the head waters of the Winnipeg river recently recommended by the Commission of Conservation, the area being one which is unfit for settlement but of great importance in connection with the equalization of the flow of this river on which such en-

ormous water powers are now being developed and which have such an important bearing on the welfare and future of the province of Manitoba.

Felt Manufacturers Tighten up

(Special to Pulp and Paper Magazine)

New York, N. Y., May 25.

The Felt Manufacturers Association recently sent a new classification of the stock required by felt makers, to the dealers in rags and paper mill supplies.

The classification contains a long list of material which can be used, and a parallel list of the things that cannot be used in making paper.

There have been differences of opinion between the dealers and manufacturers regarding the value of certain stock in the past. Dealers however are only too glad to get good stock to the mills, but they sometimes have difficulty in securing such material from packers. Some of the packings sent to mills have contained large weightings of filth, old hats, bottles, bricks, kettles, tin cans, gum-shoes and even old boilers. It has never happened according to persons familiar to mill rejections, that wood cuttings, copper wire or copper bottomed kettles were sent in the raw consignment. Dealers have been inclined to plead ignorance on the part of the practice. But the fact that there is never a consignment carrying waste materials of any value seems to contradict this.

In order to get some better arrangement for packings, the mills decided to reject all material not up to classification. This right they assumed in their notice to the dealers, which is as follows:

"Rags and all materials purchased on this order are guaranteed by the shipper to be dry and free from rubbish or any materials unsuited for making paper or felt, and when received, are subject to mill report as to weight and grading. Rags and all materials containing moisture or trash will be, at our option, subject to rejection, or if such stock be accepted, it will be at a reduction for outthrows and moisture, plus the freight on outthrows and moisture, with an additional \$5 a ton deduction on actual weight of outthrows sorted to cover expense incurred in sorting.

All waste materials to be disposed of by us.

Your acceptance of our order constitutes an agreement to the above terms.

We reserve the right to adjust any irregularities against subsequent shipments."

These terms which appear at the end of the felt makers' classification stirred some activity in the paper mill supply dealers and the Associated Dealers in Paper Mill Supplies of New York held a meeting on May 13 to discuss the question. J. M. Richardson, president of the Felt Manufacturers' Association was present and gave a brief outline of the operations of the manufacturers. He said that they were willing to cooperate with the dealers in bringing about satisfactory terms. As a result a committee was appointed to take up the question with the Felt Manufacturers.

Terms were somewhat modified by the dealers committee at a meeting held a few days ago. This suggested reading of the classification is satisfactory to several of the manufacturers and it is believed will be recommended by the executive committee of the felt makers organization to the mills.



UNITED STATES NOTES

(Special to Pulp & Paper Magazine.)

Daniel Lewerth has a habit of going it alone in all his business ventures. In the case of The Paper House of New England, of Springfield, Mass., he has bought out the other interests and has assumed personal charge of the entire business. The preference of the buyer for mill-marked, advertised printing papers has been clearly shown in the steady progress of the Paper House sales. Mr. Lewerth's plans for further development include bringing his New York house, Andrews & Lewerth, Inc., and the Springfield houses closer together. E. P. Archibald will be sales manager, and chief assistant to Mr. Lewerth in extending the company's business.

Continued rainfall in Wisconsin has sent water levels hereabouts even higher than they were a week ago. At the present writing there are five bays open in the middle dam, a condition that has not been seen here for several years. There no longer seems any likelihood of low water conditions prior to the normal water famine season, which usually sets in about the latter part of June and continues six weeks to two months. Mills in this valley are getting all the power they need.

A deal has been closed whereby the Wisconsin Tissue Paper Co. of this city, secures a lease of fifteen horse power of water power and riparian property of the Green Bay and Mississippi Canal Company. The Tissue Company intends utilizing the water power for power in its plant and on the land, comprising about two lots, the company will build storage sheds for stock. On the property at the present time is located a three-story frame building constructed some time ago for the Appleton Excelsior Company. The structure will be dismantled at once.

All the paper from now on that is used by the city government of Kalamazoo must be paper made in Kalamazoo. The council at its last session adopted a resolution calling upon all of the different city departments to insist hereafter that nothing besides paper made in Kalamazoo be used in city business. During the course of a year the city uses a large amount of paper of various grades, and while in the past a very large percent used has been Kalamazoo made paper, from now on it must be produced in Kalamazoo mills. Even concerns which bid on city printing must specify in their bids that the paper they will use is produced in some Kalamazoo mill.

The Union Paper and Twine Company, of Detroit, Mich., has purchased the factory building at the northwest corner of Fort and St. Antoine Streets, the consideration being about \$100,000, it is understood. The property has a frontage of 343 feet on Fort Street and is 130 feet deep. The paper concern will spend about \$25,000 in remodelling the structure for use as a plant.

The Bemis Brothers Bag Company, of 612 Fourth Street, South, Minneapolis, Minn., has begun erection of a seven-storey addition to its plant. The addition, according to C. B. Simmons, one of the managers, is made necessary by the State labor laws limiting the hours of labor for women. "We have to use more help on account of the new labor laws, and we have to have

more space in which to work as a result," said Mr. Simmons. The annex will cost \$30,000.

The Ashuelot Paper Company at Hinsdale, Mass., is about to construct four tenement houses near its mill on the Ashuelot road. The houses will be placed on the brow of the hill north of the road, and will be attractive, but not particularly expensive. The houses will be for the accommodation of the employees of the mill and thus save them the mile walk to the village daily.

The American Box Board Company is putting in foundations for buildings to duplicate its present paper mill at Grand Rapids, Mich. The paper mill building will be 275 x 60 feet, and the beater room 80 x 175 feet, two stories. The new buildings will be adjoining the present buildings on the west. Rapid progress is being made on the manufacturing plant across the street from the paper mill, which will be 465 x 200 feet, three stories.

The trial of the suit of Vinton A. Hogan, of Lewiston, against the Great Northern Paper Company, was begun last fortnight in the Supreme Court at Auburn, Me. In this case, the plaintiff seeks to recover as a result of an accident in the mill of the defendant corporation at Millinocket, June 16, 1913. W. H. Judkins is counsel for the plaintiff and Newell & Skelton for the defendant.

Announcement was made last week of the resignation of Joseph H. Eilers as manager of the Lockport, N. Y., branch of the United Boxboard Company. Timothy J. Neville, a Lockport man, who has held responsible positions as superintendent of boxboard mills at Wilmington, Ill., and Franklin and Urbana, O., for the last three years, succeeds Mr. Eilers. Mr. Eilers will not make known his plans for the future. He says he is considering a number of good offers. Mr. Neville was employed in various capacities at the Lockport branch before going west, and has a large circle of friends in Western New York, who will be pleased at his appointment.

Three men were killed and a number seriously injured by an explosion of dynamite being used by log drivers to blast ice near Northwest Carry, Me., on May 12. The men were members of a driving crew employed by the Great Northern Paper Company.

The total assets of the International Paper Company, whose general offices are at 30 Broad Street, New York, as of January 31, 1914, amount to \$73,010,744, in comparison with \$72,821,571 in the year before. Real estate, woodlands and machinery are carried at \$47,079,297; material, stock in process and merchandise at \$8,122,923; and cash and debts receivable at \$7,894,038, against \$7,761,239 last year. Notes and accounts payable are \$6,664,522; the funded debt is \$15,417,000; and the profit and loss is reported as \$11,079,692, comparing with \$10,596,989 a year ago.

The mill of the Central Box Board Company at Sterling, Ill., was closed for a short time several weeks ago while undergoing needed repairs. Much of the machinery of the paper mill needed repairs, and the whole mill was gone over before operations resumed.

It now appears that the business is increasing under the new management of the Nashua River Paper mill

at Peppercill, Mass., as another paper machine was placed in operation there last week.

Rephobian Carr, of Hopkinton, Mass., is proud of a letter he has just received from Charles S. Bird, vice controller, reports that in his paper mills in other states than Massachusetts, and also in Canada, he makes his four workers more than eight hours a day. Mr. Bird says that those who respect the truth might easily have learned that all his four-workers, wherever the mills are located, are on the eight-hour shift.

The work on the new building of the Dubuque Paper Company at Dubuque, Ia., has been at a standstill for nearly three months, owing to the strike of the brick-makers at Chicago, which has been in progress since March 1. This strike has caused considerable delay in building operations throughout the middle west, and although several attempts have been made by the employees to arbitrate the matter, no success has so far been noted. The building of the Dubuque Paper Company has been constructed as far as the sixth floor, but the laborers have been unable to go any further. The contractor will not make any forecast as to when the work will be resumed.

A compromise bill to regulate the water power diversion rights at Niagara Falls, N.Y., was agreed on at a conference on May 14 between Secretary of War Garrison and Representatives Harrison, Clive and Cooper, representing the Home Foreign Affairs Committee. The bill gives the Secretary of War the right to issue revocable permits for a daily diversion averaging 15,000 cubic feet per second on the American side and for importation of 250,000 horse-power from the Canadian side. The control over the rates, tolls and service would be left to the State of New York.

Listing liabilities at \$22,248.33 and assets at \$15,820.38, the Keyar Folding Box Company at Dayton, Ohio, has filed a voluntary petition in bankruptcy in the United States District Court at Cincinnati, Ohio. Of its liabilities, as listed in its schedules, \$20,256.28 represents unsecured claims. Among the larger creditors are the Rayton Savings and Trust Company, loan, \$4,200; the Third National Bank of Dayton, loan, \$4,700; the Franklin Board and Paper Company, Franklin, Ohio, merchandise, \$3,562.97; the C. L. LaBoiteaux Company, Cincinnati, merchandise, \$1,512.69; the Richardson Paper Company, Lockland, Ohio, merchandise, \$1,542.52; the Standard Paper Company, Kalamazoo, Mich., \$1,025.63; the E. G. Stands Manufacturing Company, St. Paul, Minn., \$700; the American Type Founders Company, Cincinnati, \$650; and the M. D. Knowlton Company, Rochester, N.Y., \$300.

The International Paper Company will shortly begin exporting into the States of Maine, wood pulp from New South and New Brunswick. The company has chartered the British steamer "Glenclyff" and "Glendridge" to land cargoes at Portland.

Encumbrance of a mortgage debt for \$8,923.82 held by the Springfield Paper Company against the plant of the Springfield Board Company at Newington, Conn., has been granted by Judge Bennett in the Superior Court at Hartford, Conn. The mortgaged property will be sold to satisfy the judgment.

George Brigham of Brigham's Limited, engravers and printers, has been elected chairman of the Toronto branch of the Canadian Manufacturers Association, succeeding R. D. Pearson.

Ottawa Notes

Once more destructive bush fires have done great damage to timber in the Ottawa and Gatineau districts as has been the case generally in wooded parts of Ontario and Quebec, in fact. The past week has seen conflagrations raging in the district around Ottawa which have destroyed over half a million dollar's worth of standing timber and pulpwood. The greater part of this loss has been to timber limits in the Gatineau district near Maniwaki, Que., while above Chelsea, near here, about four miles of timber have been destroyed. Nearly all the standing timber owned by the Star Creek Lumber Company near North Low, in the Gatineau valley, was also burned down. The J. R. Booth limits on the Black River near Fort Coulonge were threatened, but a large force of men succeeded in beating back the flames until Friday's rains relieved them.

The lumber village of Portage du Fort, Que., was damaged to the extent of \$150,000, the whole business section being wiped out last week.

Mr. Clyde Leavitt, chief fire inspector of the Railway Commission, stated in an interview that the railways were doing everything in their power to prevent bush fires near the railway tracks from spreading. "It seems to me," said Mr. Leavitt, "that there is too little attention paid to the fires in the cut over areas, and too much protection concentrated on the merchantable timber limits. If more effort were devoted to protecting the young timber it would give it a chance and prevent the fire from spreading to the limits where the trees are large enough for merchantable use."

The lowness of water in Ottawa district threatens to become a very serious problem both to lumbermen and paper mill owners. The water level at the foot of the locks at Ottawa in the Ottawa River is now about 14 feet, or 6 feet lower than the average for the time of year. There is so little water in the tributaries that thousands of logs are tied up in the creeks and lakes of the Ottawa and Gatineau chains. Along the River Desert conditions have been so bad that lumbermen have been unable to get their logs out at all. Last year saw low water conditions which according to the statement of an official of the J. R. Booth Company to your correspondent, made it necessary for that firm to purchase a large quantity of pulp from other sources. This year conditions will be very much worse. Not only will the low water tend toward a shortage of pulpwood—though this will be felt more next year than during the present season—but it will deprive the mills at the Chaudiere of part of their source of power and force them to run at half capacity.

Mr. J. R. Booth, Ottawa's veteran multi-millionaire lumberman and paper manufacturer, is so far recovered from the effects of the injury sustained some months ago at his plant that he is able to be at work again every day, as has been his wont during the greater part of his busy 87 years. Mr. Booth still requires the use of a cane, but this in nowise impedes the activity of his movements. He personally superintended from Ottawa the handling of the fire fighting force which guarded the Booth limits on the Black River during last week's bush fires. MAC.

A sale of 40 shares of Toronto Paper Mfg. Company last week at forty one was a decided drop in quotations from the previous figure, sixty having been the prevailing price. This, however, is thought to be only an isolated case.

CREDITORS OF BATTLE ISLAND PAPER COMPANY ORGANIZE

(Special to Pulp and Paper Magazine)

New York, N. Y., May 25.

Bondholders of the Battle Island Paper Company of Fulton, N. Y. which has been in financial troubles for several months, have formed a bondholders Protective Committee for the purpose of better protecting their interest in the final settlement of the Corporation's affairs. The members of this committee are: S. Gay Daley, A. N. Ellis and Henry Lacy of this city and Giles S. Piper and A. W. Wiltzie of Fulton.

If the suggestions of the committee prevail, the bondholders will be permitted to withdraw their bonds from the Creditors Protective Committee, of which Paul Bayne of New York, is chairman, and which last summer assumed charge of the situation created by the financial embarrassment of the Hunters.

Under the creditors' agreement of July 19, 1913, four Syracuse banks, holding bonds as collateral for loans, transferred the bonds as well as the notes to Mr. Bayne's committee.

Now it is proposed that these collateral bonds shall be returned and reduced to ownership in order that the bondholders can act together in liquidation proceedings, under direction of the Supreme Court, which appointed the receiver. An agreement between the Creditors Committee and the bondholders for the purpose of carrying out the plan has been drawn, but not signed.

The significance of this step to reduce the collateral bonds to ownership, it was said yesterday, is the belief that as matters now stand there is no equity in the properties of the company covered by the mortgage which secures the bonds. The total bond issue is \$500,000, and a considerable portion of it has been used as collateral.

A new phase of the situation developed last week when attorney W. P. Gannon filed a petition at Norwich, asking the appointment of receivers for the company. The application was made on the ground that the company had committed an act of bankruptcy in filing a petition in March 7 and having F. B. Shephard appointed receiver at that time. The new petition was signed by the Hood Coal Company, of Seneca Falls; the Morse Chain Company, of Ithaca; and the Hunter Fan and Motor Company of Fulton. It was stated that the company's affairs were dominated by the creditors' committee and that the affairs of the company were in such condition that the appointment of receivers was advisable.

Judge Ray appointed Charles N. Bulger, of Oswego, and David S. Costello, of Syracuse, receivers and fixed their bond at \$100,000. F. B. Dilts, of this city, and Harold Stone and F. B. Scott, of Syracuse, were appointed appraisers the same as for the arms company.

Included in the assets are: Cash on hand, about \$250,000; accounts receivable, \$500,000; supplies and raw material, \$20,000; buildings, land, machinery, etc., \$250,000; timber lands in Canada over \$500,000; and claim against the State on account of the appropriation of the company's power house, electric machinery and water power on the Oswego River, \$1,850,000.

The order of Judge Ray gives to the receivers possession of all property and assets of the company and directs the company and Mr. Shephard, who was receiver under the dissolution proceedings, to deliver to the receivers all property, assets and effects under their control. The order also restrains all offices and

directors of the company from prosecuting proceedings in the State Court for dissolution. It also restrains all from transferring, moving, or selling any of the property and also restrains from beginning any action against the bankrupt.

RECEIVER AND ADJUSTER APPOINTED FOR REMINGTON-MARTIN GROUP.

(Special to Pulp and Paper Magazine)

Watertown, N. Y., May 25.

The failure of the Remington-Martin group of paper mills in this section several weeks ago has caused considerable uneasiness on the stockholders as well as the bondholders and others interested in the welfare of the concerns. The crash was not altogether unexpected as the companies have been endeavoring to reorganize for two or three months. At one time Arthur C. Hastings, president of the American Paper and Pulp Association was slated to head the group and put them on their feet. The deal however fell through and Mr. Hastings was made president of the American Writing Paper Company.

Frank L. Moore, president of the Newton Falls Paper Company who is closely identified with other paper companies in this district was also invited to head the Remington-Martin concerns, and at one time it was thought that he would accept the proposition. For some reason or other he did not consider it and on May 8 a creditors' petition against the Company was filed in the United States Court of Utica, N. Y., and an adjuster and receiver was appointed. The liabilities of the companies was placed at \$2,250,000.

The group consists of the Remington-Martin Paper Company, Norfolk, N. Y., the Raymondale Paper Company, Raymondale, N. Y., and the Norwood Paper Company Norwood, N. Y.

The receiver and adjuster appointed was Mark S. Wilder, president of the Diana Paper Company of this city. He furnished a \$125,000 bond, and will continue the business for the time being.

The bondholders have appointed the following committee for their protection pending the reorganization of the companies: Geo. W. Hammons, cashier of the Farmers' National Bank, of Adams; Dr. D. C. Rodenbusch, vice-president of the Bank of Philadelphia, N. Y. and E. M. West, vice-president of the Glens Falls Fire Insurance Company.

This committee has appointed former Judge P. C. Williams and Attorney N. D. Yost as counsel. The action of the bondholders in appointing a committee and procuring counsel is to get them to unite for their own protection in case there should be any necessity for them to take legal steps to protect themselves. It was said today that the action was in no way antagonistic to any one. There are bonds of the three companies amounting to \$1,074,000, and while the bulk of them are held in this city, and this immediate section, there are many of them scattered all over owing to the fact that they are of small denomination. It is claimed that one or two holders of a small amount of bonds would have little weight if it became necessary to enter a legal fight of any kind, while if all the holders were united they would have a better chance of securing the necessary protection of their property. It is believed that there would be no necessity for taking action but that it is good policy to be prepared for an emergency.

The petition was filed by Crocker and McLoughlin of New York, representing a committee of creditors of the three concerns. Insolvency was declared at a meeting of directors of the concerns on May 5th. It is announced that reorganization is pending and will be brought about within sixty days by the creditors' committee.

The stock of the three concerns is held by the C. H. and C. R. Remington estates. Former Mayor F. M. Hugo of Watertown has been acting as manager and treasurer.

Of the indebtedness \$1,000,000 is in bonds, and the remainder is due to merchandise creditors and on indebted notes to banks.

The concerns employ 1,200 persons. The joint payroll is about \$9,000 a week.

It was stated by one of the attorneys of the creditors' committee to-day that the financial troubles of the company were due to the removal of tariffs on print paper.

The appointment of a receiver was due to the prosecution of a number of suits in the State courts to recover about \$40,000 due on merchandise and to individual noteholders.

The creditors who filed the petition were the Eastern Township Lumber Company, Ltd., of Canada, with total claims for \$35,500; Peale, Peacock and Kerr of New York with claims for \$38,000, and Moore and Munger of New York with claims for \$1,500. They were represented by Attorneys Crocker and McLoughlin, who are also members of the reorganization committee.

Forest Products Exposition in Chicago and New York

On Saturday evening, May 9th, the first Forest Products Exposition held by the associated lumber dealers in the United States came to a close in the Coliseum at Chicago. The exhibit was a decided success in every way, 34,224 people attending. There were exhibits of every class of timber products manufactured in the United States, from Florida to Washington and from Texas to Maine. Novel exhibits in the way of structures which had been erected many years ago were shown as indicative of the powers of wood to withstand the ravages of time. At the close of the exhibit, a force of 300 workmen were put at work and the whole set of exhibits dismantled, packed and placed on a special train which left immediately for New York. In that city the exposition is being repeated in the Grand Central Palace, and it is expected that the attendance will quite equal that at Chicago. The exposition will close on May 30th.

The lumbermen of the United States think that the exposition was a long step toward placing the lumber business on a favorable light before the people and bringing the general public into a friendly attitude toward one of the Nation's great industries. Says the *American Lumberman*:

"Never before has the general public had an opportunity to secure such a wide knowledge of the lumber industry or to have visually demonstrated the beauty and utility of the products of American forests. The attendance increased in number from the beginning to the end and it was largely an unswerving attendance. That is to say, it was not brought about by advertising as it was by spreading the seeds from individual to individual that

the Forest Products Exposition advertised at the Coliseum was really worth seeing and worth paying the price to see.

So successful in its attractive beauty and in the interest aroused was the exposition that it is taken for granted that it will be but the beginning of a series of expositions having for their purpose the educating of the people in regard to the forest industries and, consequently, counteracting the prejudice against wood that has been so insidiously cultivated. This season there will be only one more show and that held in New York, but other cities and lumber centres will wish the benefit of a similar enterprise. Before the close of the Chicago exposition delegates from Detroit and Cleveland were asking if the show could not be moved in its entirety to those cities.

Without exception the exhibitors were pleased with the attendance, especially with its quality, and were satisfied as far as it is in human nature to be satisfied with the results obtained. Yet the results are not all in and will not be until several years have passed.

One result of the exposition that would not be noticed by the outsider, but which was manifest to those in regular attendance, is worthy of special mention. It is that representatives of competitive woods were associated for ten days in an enterprise that was a combination of co-operation and competition and yet no ill feeling or friction was engendered; but on the contrary all worked together to make the show as a whole the success it was and to promote primarily the use of wood, as against its substitutes, and only incidentally to promote the particular woods displayed. There were no sneers of one wood against another, no conflict of statements, but a thoroughgoing spirit of mutual help. Those who have doubted it was possible for the different sections of the country and the different woods to get together in the promotion of their common interests have had their doubts answered. The industry is earnestly and sincerely united in an effort to enlighten the public in a way that will be helpful to all."

Many Canadians who were present at the show gave expression to the hope that in the near future such an exhibit may be featured in Canada, mainly for the purpose of indicating to the Canadian public the very great necessity of acting upon the suggestions which have been so often made from many sources that the timber trades of Canada should receive greater protection from the constant danger to which the forest resource is subject.

CRANE CONTRACT.

An order has just been received by the Herbert Morris Crane & Hoist Company, Limited, through their agents in Vancouver, Messrs. Waddy & Young for a 10-ton Hand Operated Overhead Crane fitted with Morris Roller Bearings to the main travelling motion.

This order was placed by the City Engineer of Prince Rupert, after considering quotations from all the leading North American makers of Cranes.

The new Power House is well under way, and is expected to be in full operation before the Fall.

M. Gottesman and Son, manufacturers of kraft and sulphate pulps announce the removal of their offices from 154 Nassau St. to 18 East 41st New York City.

British Trade Notes

There was a decrease of £27,576 in the total imports of paper, etc., into the United Kingdom during April, the figures, together with those for the corresponding year, being as under:—

	April.	
	1913.	1914.
Printing or writings on reels	£ 90,455	£ 77,869
Printings or writings not on reels . .	71,316	69,423
Hangings	12,855	12,813
Other printed or coated papers . . .	24,030	20,020
Packings and Wrappings	241,066	253,491
Strawboards	101,687	83,363
Mill and wood pulp boards	34,502	36,097

Total value	£634,568	£606,992
Total quantity (cwt.)	1,087,235	1,014,894

The imports of straw, mill and wood pulp boards show a heavy shrinkage last month, the decline in value amounting to £23,065. The receipts of printings or writings mark a decrease of £14,470, and a falling off of £4052 is registered in respect to hangings and other printed or coated papers. Packings and wrappings show an increase of £12,425, and unenumerated and articles of paper were in improved demand to the amount of £1,595.

The following imports from the United States are recorded for the month of April of this and the preceding year:

Printings or Writings on Reels—		
	Cwts.	Value.
1914	4,987	£2,897
1913	1,531	824
Printings or Writings not on Reels—		
1914	3,198	5,388
1913	2,311	4,084
Printed or Coated Papers—		
1914	337	2,011
1913	717	2,642

There were no imports of reel paper into the United Kingdom from Newfoundland during April last, neither for the corresponding month of last year.

For the four months ended April last, the total imports of paper, etc., into the United Kingdom show a small increase of £10,658 compared with the corresponding period of last year. The comparative values are as under:

	January-April.	
	1913.	1914.
Printings or writings on reels	£375,093	£364,652
Printings or writings not on reels	296,269	279,161
Hangings	58,779	60,680
Other printed or coated papers	87,229	83,272
Packings and wrappings	933,431	994,090
Strawboards	341,972	303,580
Mill and wood pulp boards	216,183	218,360
Unenumerated, etc.	132,495	148,314

Total value	£2,441,451	£2,452,109
Total quantity, cwt.	4,117,456	4,005,642

Foreign competition, apparently, is very successful in the United Kingdom in respect to the supply of packings and wrappings, the value during the present year showing an increase of £60,659. The imports of printings or writings are not on so large a scale as for the corresponding four months of last year, there being a

reduction of £17,108 under the heading of "not on reels" and a drop of £10,441 in regard to the arrivals of "reel paper." Hangings show an improved demand to the extent of £1,901, but other printed or coated papers were in less request to the amount of £3,957. The strawboard market has been somewhat disturbed of late, and British imports so far this year show a shrinkage in value of £38,392. Mill and wood pulp boards, on the other hand, were in better demand to the amount of £2,177. An increase is shown in the arrivals classified as unenumerated and articles of paper of £15,819.

The countries supplying the British market with printings or writings, the comparative values being given for the first four months of this and the preceding year, as follows:

	January-April.	
	1913.	1914.
On Reels—		
Norway	£157,381	£167,310
Sweden	80,016	57,650
Newfoundland	36,850	52,271
Germany	42,225	43,048
United States	2,732	9,567
Other countries	52,889	34,806
Not on Reels—		
Germany	97,631	92,963
Norway	69,315	77,205
Belgium	28,546	33,654
United States	22,750	23,680
Sweden	38,603	22,024
Other countries	39,424	29,635

Hangings and other printed or coated papers were received as under from the countries mentioned:

	January-April.	
	1913.	1914.
Hangings—		
Germany	£35,191	£35,120
Belgium	15,681	18,620
Other Countries	7,907	6,940
Other Printed or Coated Papers		
Germany	43,568	44,889
Belgium	22,724	20,511
United States	10,442	7,595
France	7,286	6,063
Other countries	3,209	4,214

Packings and wrappings of the values stated were received from the following countries:

	January-April.	
	1913.	1914.
Sweden	£289,243	£295,576
Germany	233,668	275,696
Norway	122,165	217,419
Belgium	78,969	95,096
Russia	49,488	37,257
Other countries	69,898	73,046

The countries of supply are not given in regard to the other items specified in the import list.

Oppose Government Paper Mill

The establishment of a Government paper mill was suggested in the House of Commons the other day during a debate on the Stationery Vote, but the chairman of the Stationery Committee replied that it would not be an economical procedure. While the Stationery Office buys nearly £500,000 of paper in a year, mostly for use in London, so many varieties of paper of so many different qualities and quantities at different times are needed that a paper mill would be a doubtful experiment. At present paper mills tender for the supply of paper to the Government, although

there seems to be considerable room for improvement in this respect. Out of 206 mills out of a total of 245 mills in the country which are on the Stationery Office list, few tender. Apropos of House of Commons and paper, the class of notepaper used by members of Parliament has been again the subject of criticism, and it has been suggested that if the Government made a standard quality applicable to each House instead of there being various kinds of paper to suit various tastes, a saving of over £1,200 a year would be effected. It is reported by the Treasury that the existing stock of Parliamentary notepaper is coming to an end and it is proposed to substitute a cheaper kind of notepaper.

Printing Paper in Demand.

Figures published recently show that the circulation of the Times has jumped from 53,000 per day to over 170,000 daily, as a result of the reduction of the price from 2d. to 1d. per copy. This increased demand, it is stated by the Times, has caused a paper famine in a small way. Since the middle of March the publishers at Printinghouse Square have been engaged in a des-

perate struggle to obtain sufficient paper of the famous hard white quality associated with the Times, and an unusually large supply of paper has been manufactured with that object in view by Messrs. W. V. Bower & Sons, Ltd.; The London Paper Mills Company, Ltd.; Northfleet Paper Mills, Ltd.; Albert E. Reed & Company, Ltd.; James Spicer & Son, Ltd.; Townsend, Hook & Company, Ltd.; and James Wrigley & Son, Ltd. Even now, however, the paper states sufficient raw material for the Times is not available.

Paper Trade Journal.

PAPER YARN WOVEN INTO CLOTH.

Paper yarn is now being spun and cloth woven from it at Dundee in Scotland, in a mill which has been specially fitted for the purpose, and the proprietors of the mill who have been putting forward great efforts in connection with the business for some time past, are meeting with considerable success in the venture. The firm in question is Ferguson & Co., of Bedville Works, Lochee Road, Dundee, Scotland.

MARCH IMPORTS INTO U.S.

Special to Pulp & Paper Magazine.)

Washington, D.C., May 21, 1914.

Statistics issued by the Bureau of Foreign and Domestic Commerce shows importations during the month of March of 25,460,654 lbs. of mechanically ground wood pulp, valued at \$18,556; 58,844,021 lbs. of chemical unbleached wood pulp, valued at \$1,002,822; and 23,514,054 lbs. of chemical bleached wood pulp valued at \$557,413—a total of 107,858,729 lbs., valued at \$1,562,791. These importations all came in free under the new tariff act, and shows an increase if compared with importations of March, 1913, of 27,883,151 lbs. in tonnage and \$481,224 in value.

Only two countries exported ground wood pulp into the United States in March, viz.: Germany, 22,500 lbs., valued at \$108, and Canada 25,438,154 lbs., valued at \$189,388. The country shipping the largest amount

of chemical unbleached pulp in during this period was Sweden (20,431,278 lbs., valued at \$337,632), Canada was the second heavy shipper with 15,978 lbs. valued at \$287,782; Germany was third on the list with 11,259,588 lbs., valued at \$178,925. The other countries shipping this grade in, according to tonnage, were: Norway, Austria-Hungary and Russia in Europe.

Five countries exported chemical bleached pulp into this country during March. The heaviest shipper was Norway (13,847,480 lbs., valued at \$331,460). Germany was second with 5,352,739 lbs., valued at \$125,755; Sweden, third, with 3,080,718 lbs., valued at \$70,879; Canada fourth, with 1,065,884 lbs., valued at \$26,449; and Austria-Hungary fifth, with 167,233 lbs., valued at \$2,870.

The importations during March completed the nine months' records of the Department, and are compiled as follows with comparisons with the corresponding period of 1913:

Nine Months Ending March.

1913.	Value.	Quantity.	1914.	Value.
Mechanically Ground, lbs. (Free)	\$2,247,035	271,442,182	263,355,347	\$2,043,429
Duty	248,876	31,065,318	17,254,157	135,316
Chemical Unbleached, lbs. (Free)	678,806	37,872,666	395,642,343	6,591,590
Duty	6,626,035	429,958,985	60,219,923	994,348
Chemical Bleached, lbs. (Free)	239,942	9,282,962	108,730,723	2,529,990
Duty	2,503,982	112,074,671	13,895,570	331,230
Total lbs.	\$12,544,676	891,696,784	\$59,098,063	\$12,625,903

Importation of paper and manufactures of paper during March amounted to \$2,043,429 in value, as against \$1,135,045 brought in during March, 1913. During the nine months' periods the importation amounted to \$20,615,272 in 1914, \$16,034,128 in 1913 and \$14,714,109 in 1912. The increase of 1914

over 1913 was in all probability due to the lowering of the tariff on news print, and 1913 over 1912 to the Canadian Reciprocity Act.

As will be seen by the following table, Canada was the heaviest exporter of news print into this country in March, 1914.

Countries.	Pounds.	Dollars.
Belgium	149,247	5,700
France	4,325	293
Germany	223,024	6,938
Italy	9,248	1,344
Netherlands	234,174	10,591
Norway	662,271	13,972
Sweden	36,017	1,326
England	82,516	4,727
Scotland	43,696	2,100
Canada	52,475,307	1,012,293
Hongkong	800	53
Total	53,920,625	1,059,337

Opening of New Mills

Fort Frances, Ont., May 26th.—Victoria Day was a notable event in the history of Fort Frances, as on that day the Town Council, Board of Trade and Fort Frances Pulp and Paper Co. formally opened the new paper mill with a grand concert and ball in the evening.

The celebration was held in the finishing room of the new mill and no pains or expense was spared to make it a success. Music was supplied by an eight piece-stringed orchestra from Duluth and the floor, which is a splendid maple one, afforded ample room for 200 couple. Refreshments in abundance were served on the second floor, where the cloak rooms were situated. There was plenty to eat and drink, all of which was free. Nearly a thousand invitations were issued, including those to prominent people in Port Arthur, Fort William, Kenora, Winnipeg, Brandon, Regina, Saskatoon and Moose Jaw; also the Twin Cities and Duluth. The ball and supper rooms were a regular fairyland,

resplendent with electric lights in Japanese lanterns and flags and bunting. Colored bands of paper, the product of the mill, were used with artistic effect. The tables were decorated and the luncheon, which was served at all hours during the evening, was one of the features of the occasion.

The committee was—

Fort Frances Pulp and Paper Co.—President E. W. Backus, Mr. R. J. Young, Mr. John J. Ross.

Fort Frances Town Council—Mayor L. Christie, Councillor J. J. Habbkirk, Councillor J. P. Wright.

Fort Frances District Board of Trade—President D. C. McKenzie, Mr. O. C. Damm, Mr. J. A. Osborne.

The mill, which is one of the most advanced and up-to-date on the continent, has a capacity of 120 tons per day. It has two 186 inch Fourdrinier machines, among the largest ever built. They have a speed of 700 feet a minute. About 400 men will be employed in the mill and camps, and the pay roll will be half a million dollars annually. The power for the new plant as well as that for the paper mill, just across the Rainy River at International Falls, Minn., is obtained from Couchiching Falls, where an immense dam and power house have been constructed and 35,000 horse power of electrical energy is generated. It is expected that fifty thousand acres of spruce will be required to feed the new ground wood plant and news print mill. Fort Frances is a natural gateway for logs, and it is estimated that over two million feet of timber pass each year down the Rainy River into Rainy Lake, to Fort Frances, being sluiced through the logway specially built for that purpose.

It is expected that proposed new developments in the Ontario and Manitoba Power Company will be made known in a short time. The President, Mr. E. W. Backus, is known as one of the most progressive and enterprising of the leaders of the pulp industry.



Ontario and Minnesota Power Co. New Plant at International Falls.

PULP CONDITIONS IN EUROPE

(Special to Pulp and Paper Magazine)

New York, May 25, 1914.

There has been a good deal of variation in the reports made by importers regarding the condition of the foreign sulphite market. To get true data concerning the exact situation in Scandinavia has been a difficult task. The latest advices from Europe concerning the pulp situation shows that there is really plenty of sulphite on hand for offer both for this year and next. "Swedish papers," according to one importer, "have made much of the inquiries sent from this side of the Atlantic. There is no doubt, however, that mills have not made the best of any offers that have gone from America. The leading magazine of the Swedish pulp industry spoke truth when it reported that several sales of sulphite for prompt delivery had been made in the neighborhood of \$36.45 to \$37.55 a ton, f. o. b. export harbor for easy bleaching, including customary discounts and commissions."

Other figures were given for the various grades of sulphite which were for orders of the same character. There are a number of new sulphite mills being erected in Sweden and as a result, it is said, prices of sulphite have gone down considerably. "This reduction in price," adds the interviewee, "has brought about a number of good sales of this grade for future delivery. Foreign values have been for such orders about \$29.50 to \$30.50 f. o. b. for easy bleaching and \$28.30 to \$29.50 for strong sulphite."

According to the same reports on foreign conditions there has been a good deal of attention paid in Scandinavia to the views expressed in England that the present prices of paper in England will not permit paper makers to exceed 1.65c. to 1.75c., c.i.f. England. This, it is said, is absolutely the limit that English mills can pay. "Scandinavian mills, especially the larger ones," added the importer, "will not sell less than 1.75c. c.i.f. Great Britain at any time from this year on for several years to come. In fact, Swedish sulphite mills seem to be determined on boosting the price of sulphite to 1.95c. a pound, c.i.f. Of course, paper makers in England are unanimous in their view that this is positively an impossible price. This is probably due to the fact that, contrary to British paper makers' statements, the tendency in England to-day is a cheapening of paper prices. This may alter the attitude of the sulphite maker. Leading agents in England to-day are asking prices c.i.f. England about as follows:

Bleached Sulphite	2.55c. to 2.65c.
Easy Bleaching Sulphite	1.87½c. to 1.90c.
Unbleached Soda	1.67½c. to 1.80c.
Strong Sulphite	1.62½c. to 1.67½c.
Unbleached Soda	1.57½c. to 1.67½c.
Kraft	1.50c. to 1.57½c.

How much business is done at these prices is difficult to say."

There is a prevailing impression abroad that American mills are inclined to hold off in making contracts, as they believe that foreign pulp can be bought in the future at a price that is lower than now quoted. The impression is that Americans believe prices will weaken and that they will delay entering into contracts as long as the present prices are insisted upon by Swedish pulp producers.

Important as not unlike this in attitude and paper makers there are not inclined to buy unless compelled to do so. Thus, it is an interesting study of sulphite unsold

in Germany. The present price of Russian pulp wood has caused certain German pulp manufacturers no little difficulty. They find it necessary to look to other quarters for their timber and have made a rather impolitic move in trying to obtain supplies of wood from Sweden."

The situation abroad appears to be then that, although there are rather plentiful supplies of pulp on hand in manufacturing centres, the producers are not anxious to reduce the price in order to cut down any over production. The insistence of British paper manufacturers may tend to shade prices slightly, but pulp producers are making a decided effort to maintain 1.75c. as a minimum, and in fact are strongly bent on pushing the price nearer 1.90c. Spot orders for prompt delivery are commanding fairly good prices, viz., 1.85c. to 1.87½c. for easy bleaching, and 1.62½c. to 1.67½c. for strong sulphite, at the mill. These are evidences of what may be the future value of pulp when paper makers come actively into the market.

MACHINE FOR CLEANING BLOCKS OF WOOD.

A machine for cleaning blocks of wood has been patented in Germany, which comprises a conveyor which conducts the blocks longitudinally through the machine, and a roller which is built up of small grinding discs in order to be able to grind the uneven parts of the wood. A second roller is provided with longitudinal grooves about 1.5 cms. apart. Both rollers rotate in the same direction. The grinding roller has a speed of 700 and the other 20 revs. per minute. An automatic feeder supplies the blocks into the machine and the conveyor guides the block through the machine. The speed of the wood when passing through the machine can be regulated according to the nature of the wood. Well seasoned timber can pass through the machine at a high velocity.

Spraying pipes constantly clean the wood and the grinding faces from bark and dirt whilst the machine is working. The loss of wood in the machine is 5 per cent less than that of other machines known heretofore. Papier Fabrikant.

CATALOGUES

Morris Travelling Trolleys

A copy of the newly issued bulletin B5 of the Herbert Morris Crane and Hoist Company, Ltd., is just to hand, describing the various types of traveling trolleys made by the company. These Morris trolleys are of many patterns, to run either on a flat bar track or on the lower flange of an ordinary steel I beam. Some of them are prepared for short straight runways, while others, containing suitable swivels, are flexible in a horizontal direction, and thus permit of the use of curves or "bends" in the track. The bulletin contains a great deal of practical information of immediate interest to all users of this kind of equipment. The illustrations, diagrams and tables of dimensions and prices are arranged in a handy and useful form.

BACK NUMBERS OF THE PULP AND PAPER MAGAZINE WANTED

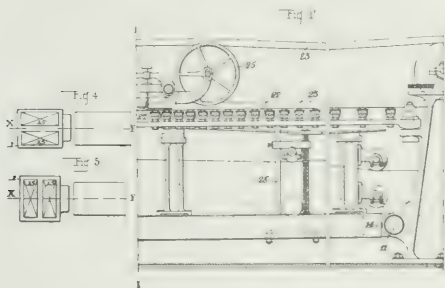
The publishers are anxious to secure copies of the July 1st and July 15th, 1913, issues of the Pulp and Paper Magazine.

NEW PATENTS

PAPER-MAKING MACHINE.

Marcel Lamort, of Vitry-le-Francois, France, Inventor.
U. S. PATENT No. 1,093,998.

The present invention relates to a new arrangement of the working table or frame for paper making machines in which the strainer or strainers participate in the shake and in the vertical adjustment of the frame, the characteristic feature of the new arrangement being the combination in a single and uninterrupted structure of the strainer and the frame or



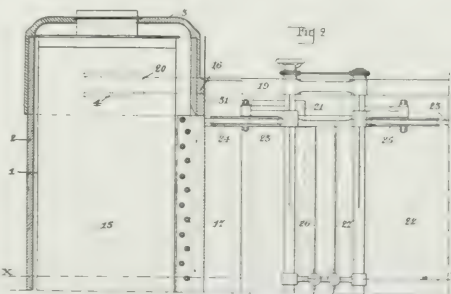
working table of the paper making machine.

According to the present practice the strainers of the various types in use which are arranged at the wet end of the paper making machine are not rigidly connected with the frame proper over which the wire is moved. On the contrary the two named parts of the paper making machine are generally separated by passages and in all the known constructions the pulp passes from the strainer on to the wire through channels or chutes which are of a more or less complicated construction and frequently comprise small cascades. Moreover in the known constructions, the table or frame proper receives a shaking motion from side to side called "shake," whereas the strainers do not participate in the said movement. According to the present invention the said two parts of the paper making machine, namely the strainers and the frame proper are combined in a single and compact structure in such a manner that the straining apparatus forms an integral part of the frame proper and entirely participates in the shaking motion. This arrangement has very important advantages as regards the construction of the paper making machine and also as regards the manufacture of the paper or cardboard produced thereon.

As regards the construction of the paper making machine, the new arrangement forming the subject of the invention enables a considerable simplification to be realized as it permits various parts which were hitherto required between the strainers and the wet end of the machine, such as chutes, channels, aprons made of rubber and gates to be entirely dispensed with. The improved arrangement has moreover the following advantages: It enables the breast roll end of the frame to be adjusted to different elevations within very wide limits and without the use of any special devices,

The vat of the strainer may be utilized as the main cross beam connecting the longitudinal beams of the frame proper. The space required for the installation of the straining apparatus is reduced to a minimum which results in a considerable saving.

As regards the formation of the paper or cardboard sheet, the advantages of the improved arrangement forming the subject of the invention are the following: The length of travel of the pulp is reduced to a minimum. The loss of pulp due to the necessity of changing from time to time the grade of the stock and to stoppages is reduced to a minimum. Since the vat of the straining apparatus takes part in the shaking motion of the frame, the pulp contained in the vat is continuously shaken which has the result of avoiding the formation of deposits and of maintaining the pulp in a very homogeneous condition of density in all parts of the vat. If strainers of the revolving type are used the improved arrangement increases the output or efficiency of the strainers as owing to the vibratory motion of the vat or vats with regard to drum or drums, which latter remain stationary, a number of pulsations is produced between the pulp contained in the drums and that contained in the vats. These pulsations facilitate the passage of the pulp through the slots of the drum which may in the usual manner have a combined rotary movement and up and down vibration. Since the width of the pulp sheet which passes from the discharge end of the strainer is exactly equal to the width of the sheet produced upon the frame (both being regulated by the so-called deckle straps made of rubber) all causes leading to a disturbance of the flow of the pulp by an increase or a reduction of the sectional area of the passage of flow are eliminated. These advantages are of the greatest importance as regards the formation of the sheet, as waves or ripples in the sheet are entirely avoided owing

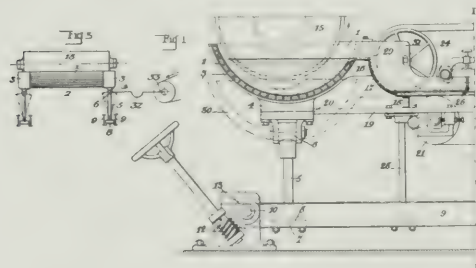


to the fact that the fibers flow along absolutely rectilinear paths from the vat of the strainer down to the gates or slicers which serve for determining the height or thickness of the sheet. The height or thickness is therefore maintained absolutely equal along the whole width. The improved arrangement moreover avoids one of the main causes of the formation of so-called pointed sheets since the quantity of pulp which arrives at the gates or slicers is absolutely uniform along the whole operative width of the frame.

In order that the invention may be clearly understood, one construction of the parts necessary to carry out the invention is illustrated in the accompanying drawings, the strainer illustrated being of the revolving type, for instance, a strainer of the known construction "Lamort." It should be noted, however, that the invention is not in any way restricted to the use of any particular kind of strainer, since most of the known kinds of strainers, flat as well as revolving, may be used in connection with the present invention, in some cases suitable alteration of the vats being required for the purposes of the invention.

Figures 1 and 1' assembled along the line I-I represent in elevation the straining apparatus combined with the frame proper of the paper making machine. Fig. 2 is a plan of one-half of the parts arranged near the breast roll end of the machine, the other half not shown being symmetrical to the illustrated half. Fig. 3 is a diagrammatic view illustrating the mechanism for imparting a shaking motion or jog to the vat of the strainer. Figs. 4 and 5 are diagrammatic top views showing two manners of mounting two strainers in a common vat, in the case of large paper making machines.

Throughout the drawings the same reference numbers have been used for the same parts.



In the example shown in the drawings, 1 represents the vat of a strainer of the Lamort type, which may consist of a number of wooden boards 2, the ends of which may be fixed by bolts in two pieces or cheeks 3 made of cast iron. These end pieces serve as supports and are provided at their undersides with suitable projections 4 to which are hinged at 6 vertical rods 5 of the kind generally used for supporting the frame proper. The lower ends 7 of the rods are adapted to pivot about the bearing plates 8 carried by means 9 which rest at their ends 13 upon supports 10 and are adapted to turn at their other ends about pivots 11.

The longitudinal beams 9 may be raised or lowered in a well-known manner by means of a cam and a screw spindle 12, their ends 14 being as above mentioned pivotally supported at 11.

It will be seen that the vat 1 of the strainer participates in the vertical adjustment of the table, while the frame 15 of the strainer as well as the means for rotating and vibrating the drum in the vertical direction, which means are not shown in the drawing, remain unaffected by the adjustment of the frame. The drum and its driving means may for this purpose be mounted independently upon the main frame, or directly upon the floor. The lateral cheeks of the vat are provided with extensions 16, to which is connected

by bolts a curved copper sheet 17, which extends the whole width of the working frame. The sheet 17 is also mounted upon a cross member 18 and the whole combination of parts is mounted upon the longitudinal beams 19, which are usually called the main beams of the working frame. It should be noted that contrary to the constructions at present in use, the main beams 19 are continued in front of the frame and are fixed at 20 to the vat 1 of the strainer.

21 is the breast roll, whereas 22 designates the endless wire cloth of the machine.

23 are the rubber straps usually called deckle-straps, which serve for determining the width of the paper sheet to be produced upon the wire 22, the said straps being as usual supported by grooved pulleys 24 and 25.

26 and 27 are the usual cross gates or slicers which serve for determining the thickness or height of the sheet of pulp flowing upon the wire, 22 according to the nature of the paper to be produced. Other vertical rods supporting the main beams 19 are shown at 28.

It should be noted that most of the elements are shown diagrammatically only, as they are very well known parts of a paper making machine.

The pulp passes from the vat on to the wire 22 directly flowing along the sheet 17, as soon as the level of the pulp within the vat reaches the point 29. It may be pointed out that the vat 1 may be arranged at any desirable height with regard to the wire, for instance as shown by chain lines at 30 in Fig. 1. A tight joint between the discharge end of the vat and the deckle-straps 23 is insured by means of copper plates 31 adapted to slide across the discharge end of the vat and to be adjusted according to the width of the paper sheet to be produced.

Fig. 3 shows diagrammatically the known arrangement for imparting to the table the lateral shaking motion called jog, in which the vat 1 of the strainer participates according to the invention. In the example shown the shake is obtained by means of a connecting rod 32, which is hinged to the main beam 19 and is driven by the crank 33.

For machines dealing with a very large quantity of pulp, two or more drums such as 15, 15', may be arranged within a common vat. As shown in Fig. 4 the axis of the drums may be parallel to the axis X-Y of the frame, or as shown in Fig. 5, the drums may be arranged at right angles to the longitudinal axis of the frame. In both cases the straining mechanism is connected with the working frame in the manner above described.

EDWARD P. BUTTS, OF SPRINGFIELD, MASS., INVENTOR PROCESS FOR DRYING PAPER

U. S. Pat. No. 1,094,195.

This invention relates to improvements in processes for drying paper.

Broadly, the invention consists in modifying the condition of the atmospheric air so as to enable it to take up or absorb definite quantities of moisture. This feature is very desirable in the manufacture of paper, particularly in that part of the making which relates to the drying and lifting process.

It is a well known fact that the quantity of moisture contained in the atmosphere varies from day to day with relation to its saturation point. This variation of course materially affects the rate at which it will absorb any additional moisture. For this reason the rate of drying paper depends very materially upon the percent. of moisture contained in the air of the drying

room. Some days it is very dry, and others very much saturated. On the days that the air is very dry the output of the mill is greatly increased, while on the moist days the output is very much lessened. The output is therefore uneven both in quantity and quality, due to this lack of uniform conditions in the process.

A feature of the invention is that it makes possible the maintenance of a uniform condition readily changed and made suitable for any particular quality of product affording rapid drying or lofting for a paper re-

ing the suspended paper in side elevation. Fig. 6 is a view similar to Fig. 4 but showing the conditioned air applied to the paper on a drying machine with the inlet and escape pipes for the air. Fig. 7 is a view of Fig. 5 in side elevation showing the position of the air inlet pipes.

Referring to the drawings in detail, a designates the casing member, one end of which is provided with a suction fan b. Located within the casing, adjacent the outlet of the suction fan, are a series of pipes c provided with nozzles d for producing a fine spray effect of the water, so that when the air leaves the fan and passes through the spray it will be thoroughly saturated when it leaves the spray. The water from the spray is caught in the lower part of the casing, as shown at e, where it escapes therefrom by means of the trap f. Placed beyond the spray g are a series of plates h against which the saturated air strikes so that the surplus or entrained water contained therein is separated therefrom when it strikes these plates. After the air leaves these plates it passes over a series of heating coils i, which have their ends connected to the upper and lower drums j and k, the upper drum being connected with a steam supply pipe m. Located within this pipe is a valve o.

p designates a steam gauge to indicate the pressure within the supply m, and consequently that supplied to the coils i.

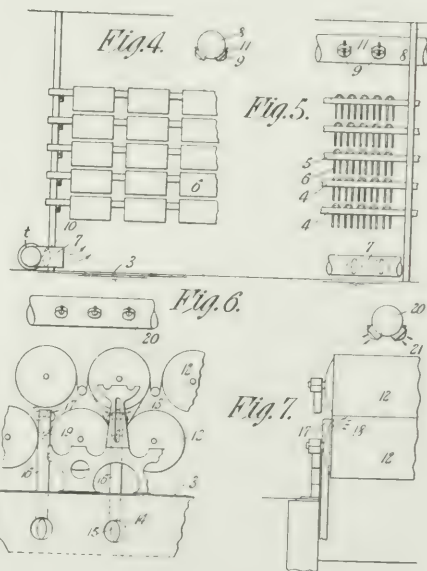
Connected to the valve o is a thermostat by means of a suitable connection s whereby the flow of steam to the coils i may be regulated to produce and maintain any desired temperature of the air as it leaves the coils and before it passes from the casing for use

quiring such treatment, or slower drying or lofting for a paper requiring such conditions.

Another feature of my invention is that each quantity of paper is dried or lofted in the shortest possible time which develops the maximum product for these departments in any existing plant and requires a smaller outlay in the construction of the new plants.

In general, the invention consists in modifying the condition of the air that is sent to the drying or lofting rooms so that its capacity to absorb moisture is practically definite and uniform for any particular grade and weight of paper to be treated, whereby the output of dried paper is materially increased and the product rendered uniform from day to day.

In the drawings forming part of my application, and which illustrate one form of apparatus in which my invention may be carried out, Figure 1 is a plan view of the apparatus showing the heating coil, shower pipes, the thermostat, and the enclosed casing. Fig. 2 is a side view of the same illustrating the interior construction thereof. Fig. 3 is an edge view of one of the sections of the heating coils. Fig. 4 is a view in side elevation indicating paper suspended in lofting room in the usual manner and inlet and outlet pipes to permit the conditioned air to enter and escape therefrom. Fig. 5 is a view similar to Fig. 4 but show-



in the drying or lofting rooms. Therefore, the temperature of the saturated air is changed after it leaves the plates h and before it escapes from the casing a at

the point t, from which it passes on to the drying room. g designates a trap which is attached to the drum to carry away the water condensation.

From this apparatus it is clear that the temperature of the air, after it leaves the spray of water g, is the same as that of the water, say for example 65 deg. Fahrenheit, and that the air is of course in a saturated condition. It is also clear that if the temperature of this saturated air is raised, say to 80 deg. Fahrenheit, it will be in a condition to absorb or take up more moisture.

Referring now to the manner in which my improvement is applied to the drying of paper either while in the loft or passing through the drying machine, 3 designates the floor line of the drying room and 4 the beams for supporting the bars 5 on which the sheets of paper 6 are suspended. The conditioned air as it leaves the outlet shown at t in Figs. 1 and 2 enters the drying room or loft by means of pipe 7 and after passing upward through the drying room it escapes therefrom by means of the pipe shown at 8, entrance to this pipe being shown at 9. These two pipes are provided with suitable dampers or regulators indicated at 10 and 11 whereby the rapidity or rate of motion of the air through the drying loft is varied. After the air has taken up moisture in passing through the drying loft it is again drawn from the drying loft through the pipe 8 which leads back to the fan b, shown in Figs. 1 and 2, and is again passed through the spray of water shown at g, and its temperature again raised to the desired quantity, and a second time is drawn through the drying loft as described.

As showing the application of my invention to a paper drying machine reference is made to Figs. 6 and 7, in which the drying rolls are indicated at 12, over which the web of paper passes, shown at 13. The conditioned air from the outlet pipe t passes by means of the pipe 14 to the drying machine in which are placed dampers 15. The air from the pipe 14 passes upward through the pipe 16 and escapes at the outlet opening 17, as indicated by the arrows at 18, which causes the conditioned air to be blown parallel with the axis of the drying rolls and constantly into contact with the paper 13. The damper 19 is placed in the pipe 16 after the air has escaped from the pipe 16 and passed in contact with the web of paper and it is drawn through the pipe 20, which leads back to fan d. Suitable dampers or controlling devices are placed in the entrance or inlet openings 21, whereby the passage or rate of motion of the conditioned air through the drying machine is controlled.

By adjusting the temperature of the air as it leaves the casing a at the point t, it will be seen that this heated air, when it enters the drying room, is in condition to absorb a definite amount of moisture in drying or lofting the paper, which condition may be changed at will regardless of the moisture condition of the outside atmospheric air, to a capacity for absorbing a greater or less amount, as required for the particular grade or weight of paper to be treated. This method of causing air of exactly the same capacity for absorbing moisture to enter the drying room, assures a definite amount of moisture will be taken up by the material, as is one that greatly increases the quantity of paper dried or lofted, and at the same time renders the same method in both quantity and in quality for each particular grade from day to day. The air, after it leaves the drying room, may, if desired, be returned or drawn back to the casing by means of the fan b and again sent to the drying room.

FREIGHT RATES ON NEWS PRINT

May 28, 1914

Washington: Carriers have been notified that rates on news print paper in carloads from Sault Ste. Marie, Ont., to points in Michigan, Ohio, Pennsylvania, and Indiana should be reduced on an average of 2 cents per 100 lbs. to conform to existing rates from Wisconsin mills. It is also held that rates to Illinois destinations and to St. Louis must not exceed by more than five cents the rates from Fox River group.

HOW MANY FEET IN A LOG?

At the recent Forest Products Exposition in Chicago a novel contest was carried on by the "American Lumberman." The contents of a black walnut log which formed a corner pillar of the exhibit was to be estimated by visiting lumbermen. Out of 11,423 guesses seven estimated the actual contents, as was shown by the subsequent sawing of the log in a Chicago mill.

WORKING-UP WASTE PAPERS

The treatment of waste paper is different according to whether a mill works up regularly, or only now and then. In the latter case only the best sort of scraps is used. In the former case all sorts are worked up except the dearest.

Waste paper has become an important article of commerce, and there are special sorting establishments which will undertake to maintain a supply of any particular kind of scrap. As many as 40 different classes are made, and these are again sub-divided according to color.

The sorting and working up of the waste in small quantities for mixing in small proportions with whole stuff presents no difficulties, as no special machinery is wanted. The case is different when 10 tons or more of waste are used every year, and the sorting of such huge quantities cannot be economically done in a paper mill.

Large quantities mean large warehouse space, for the scraps must not be kept in the open air. A good airy shed is the best store-room, as it shelters the bales from wet while allowing free access of air. It should be as near the shop where the scraps are treated as convenient.

The best boilers for waste paper scraps are the spherical form, and the sorting room should be over the boiling room. For sifting out dirt hand sieves can be used, or an endless travelling screen. The sorting must depend on circumstances. Thus in sorting scraps with a view to making coloured paper more attention must be paid to quality than to colour. The boiler should hold two tons of paper or more. It cannot well be too large. One ten feet in diameter is none too big.

It is economical to use an old boiler, as it is not used for heating, but simply to soak the scraps. If heat is employed, the size in the paper scraps will be removed entirely. Some is unavoidably lost, but whatever is left makes economy in the after-sizing of the new paper into the composition of which the scraps enter. The boiler can be filled loose with the waste paper, or it can be squeezed in if it is necessary to make the boiler take up a large quantity. It must, however, be remembered that wood papers swell, so that they, or scraps containing a large proportion of them, must not be packed too

tight. It is essential that the rouser in the boiler should not be interfered with in its action. Three or four hours are required in the boiler, which is revolved about five times per minute. This treatment facilitates and shortens the subsequent pug-mill work materially, and as the largest spherical boiler takes up no more than five horse-power—much less than a pug-mill—the economy of the previous treatment is obvious. No good results can be expected if the soaking is omitted.

As a substitute for the pug-mill, the kneading machine is not to be recommended.

The hollander must not receive the stuff too thick from the pug-mill, or the pulp will get too greasy. This danger is particularly imminent with long hollander rolls of large diameter, which work very rapidly.

As regards the work on the wire, the whole stuff must be greasy to prevent the water from running off too freely. It is often a good plan to warm the pulp a little, especially in making thick papers. Four suction boxes are used, two with suction and two without.

The felt of the upper couch roll may be an English unwoven one, if the paper has been well sorted beforehand, so that there are no coarse impurities. There ought to be three wet presses, with felts not too close, but not loose enough to mark the web.

The dry end should be ample, as gradual drying is advantages. Papers to be satined on one side only should not come too wet to the drying cylinders, or the moisture will escape slowly, and unevenly, and creases will be produced. A long wire is almost invariably necessary, if the machine is to be run at any reasonable rate.

We may now allude to some of the later ideas, some patented and some not, which are connected with using waste paper over again. Most of the patented processes involve the use of reagents for removing printer's ink and bleaching. Hence they are too troublesome and expensive. It is far better—in fact, the only way—to sort the waste paper, and to use printed stuff only for making coarse coloured new papers.

In conclusion, it is to be remarked that super-calendering is advisable, when possible, for papers into the composition of which much old waste paper enters. The calendering conceals the look, indescribable in words, which such papers are too prone to manifest, and which the expert remarks immediately.

Under present-day conditions, it is practically impossible to make wall-paper, even its best kinds, without the use of old scraps. The case is different with wrappings. No strength is wanted in a wall paper, but a packing paper does require a certain amount. Hence the use of old paper in its manufacture requires care, and respectable makers of wrappings, who are the majority of the trade, take care to use only the best unprinted white scraps, and then in not too large a quantity.—Papier Zeitung.

SUBSTITUTE FOR CASEIN.

The product of experimental work on a substitute for casein in manufacturing coated paper shows remarkable results. The substance has been named Vegesto, and the intention on the part of its promoters is to form a company to manufacture coated paper, using it as a binder for the coating in place of casein or glue. Its value consists in its cheapness of production as well as the reduced mechanical operations necessary to its application, together with the fact that it may be mixed

and kept standing without danger of decay or acquiring a disagreeable odor.

Unlike the casein or glue preparations which are at present used in making coated paper, it requires no boiling or steam heating, but may be mixed with cold water and clay, blanc fix and satin white. It dries very quickly, thus reducing the space ordinarily required in drying coated paper which at present must be festooned for some 150 feet and dried in a room at a very high temperature.

These conditions of manufacture, saving as they do the waste and labor, necessarily reduce the costs of making. The paper made with it will not curl. It takes a gloss almost as high as a friction finish paper, and samples of machine finish book paper as light as 25x38-30-500 have been coated with satisfactory results. Box boards coated with it seem to have much better folding qualities—the coating does not seem to crack so readily. It is also claimed that it will save considerable over regular coated paper in printing ink.

Excellent printed samples in half tone and color work are shown, and label printers who have used the paper say it will take varnish to perfection. Eight colors of printing have worked satisfactorily.

A stock company to exploit the new proposition is now in process of formation and samples of the finished printed paper may be seen at 5 Beekman Street, New York, room 324. It is intended to call the company the Vegesto Coated Paper Co.—United States Paper Maker.

TWO BAD FIRES.

The fire which broke out near Digby on the afternoon of the 25th inst. did more damage than it was originally supposed. The blaze started in the yard of the Old South Road mill and, driven by a strong east wind into the dry underbrush, spread over a district of ten square miles. The homestead of Stephen Marshall barely escaped, as did the old mill, but the timber limit belonging to H. P. Warne and Company was badly damaged, although their mill was saved.

Damage to the extent of \$75,000 was caused on the night of the 25th inst. by a fire in the Royal City Shingle Mills, near Westminster. The premises were well ablaze when the fire department arrived and nothing could be done to prevent the spread of the flames. The building was completely gutted.

CONCESSION TO BEAVER BOARD CO.

The St. Catharines Board of Water Commissioners has given permission to the Beaver Board Company to waste part of the overflow water from the Beaver-board factory above Thorold, into the Beaverdams creek. It was pointed out that this water could in no way contaminate the city water supply; the provincial Board of Health had given its sanction to the proposition.

Superintendent Milne said there was no chance of this water getting into the city reservoirs.

The desired permission was given upon the understanding that an agreement is to be drawn up by the city solicitor between the commission and the company to the effect that if at any time the overflow water from the factory is shown to be injurious to the city system, it be at once cut off, and a daily penalty for non-compliance is to be inserted in the agreement.

PULP AND PAPER NEWS

Mr. Col. A. G. Peuchen has retired from the Presidency of the Standard Chemical, Iron and Lumber Co., Toronto, and L. M. Wood, of J. and L. M. Wood, has been appointed his successor. The company manufactures various wood chemicals and have four factories in Ontario and two in Quebec, with refineries in the Dominion, England, Germany and France. The securities of the company are largely held in England.

W. J. Boyd and E. S. Davidson of Ottawa, who are graduates of the Toronto School of Forestry, recently left Prince Rupert, B.C., Big River, en route to the Yukon on an extensive timber cruising expedition in the interest of fire protection of the province.

James Murray, who was the first President of the Master Printers and Bookbinders Association in Toronto and for many years president of the Murray Printing Co., Toronto, passed away recently after a short illness. Pneumonia was the cause of death. He was born in Glasgow, Scotland, in 1844, and came to Canada in 1868.

Richard Brown, the veteran head of Brown Bros., wholesale stationers, Toronto, on May 13 celebrated his eightieth birthday. He is still active and hearty and comes down to business every day. The twenty wholesale stationers of Toronto took occasion to present him with an appreciative address on vellum accompanied by a bouquet of eighty American Beauty roses, one for each birthday. The address expressed the hope that Mr. Brown might enjoy many more years of peace and joy and referred in the highest terms to his integrity and splendid record as a business man and honorable competitor. He joined his brothers in the formation of the present firm in 1856.

The work of cleaning out and repairing the old Welland canal, from which many paper mills in St. Catharines, Merrittion and Thorold, obtain power is progressing favorably, and in the meantime the plants are all receiving a thorough overhauling. It is expected that operations will be resumed about June 4th.

Many plants in Ontario are complaining of low water and the level of the St. Lawrence is several feet below normal. On some of the northern streams there is being experienced considerable difficulty in getting out timber drives. November and January have been the only months that have come up to the average in precipitation and the outlook for high water is not bright in view of the fact that the total rainfall of last year was 24.11 inches while in the year previous it was almost 40 inches. So far there have been only two rainfalls to amount to anything. They were on April 29 and on May 25. The latter extinguished the forest fires which were raging in many parts of northern Ontario and threatened to do great havoc.

W. L. Englehart, Chairman of the Timbessawing and Northern Ontario Railway, who has returned from a session of the government line, states that a great deal of damage was done to standing timber by the recent fires. Mr. Englehart added that the question of

extending the railway from Elk Lake to Gowganda and on to Sudbury is in the hands of the Ontario Government. The Commission has found that a line can be constructed for half a million dollars less than any previous estimate and is ready to go ahead when word is given from the parliament buildings.

It is expected that the Ontario Government will shortly appoint the Commissioners to carry out the provisions of the Workman's Compensation Act which was passed at the last session of the Legislature.

Many friends in the trade will extend sympathy to Alex Buntin of the Buntin, Reid Co., Toronto, in the loss of his mother, who passed away on May 25 at the residence of her son, 93 St. George Street, Toronto. She was the widow of the Alex Buntin, one of the paper pioneers of Canada.

H. Biermans, President, and A. G. Campion, sales manager of the Belgo-Canadian Pulp and Paper Co., Shawinigan Falls, Que., were in Toronto last week on business. They expect the new machine of the plant will be in operation by January 1st next, which will increase the output of news print to 175 tons per day.

The Axe Lake mill of the Muskoka Wood Manufacturing Co., was totally destroyed by fire on May 19, and gangs of men had a hard fight to preserve the camps of the company from destruction.

J. L. McNicol, general manager of the New Brunswick Pulp and Paper Co., Millerton, N.B., who has been spending a few days in Toronto, and with his family, in Georgetown, returned to Millerton this week. Mr. McNicol expects that the plant will resume operations in the near future. There is a strong probability if certain negotiations now pending are completed and adjacent limits acquired, that the mill may be converted into a news print plant.

The assets of the Northern Islands Pulpwood Co., Limited, of Port Arthur, who made an assignment some months ago to G. T. Clarkson, of Toronto, have been sold to P. H. MacPherson, of Detroit, representing the Detroit Sulphite Co., who are one of the largest creditors, their claim amounting to about \$150,000. It is understood that the creditors will receive thirty-one cents net on the dollar in payment of their claims.

It is expected by the directors that the new ground wood plant of the Abitibi Power and Paper Co. at Iroquois Falls, Ont., will be in operation by July 1st. Good progress is being made on the new paper mill, and recently the force of men was considerably added to in order to rush the construction to completion.

Joseph G. Mayo, formerly of the Spanish River Pulp and Paper Mills, Limited and William S. Hofstra of Price Brothers Company, Quebec, are among those interested in the development of the Southern Paper Company, Moss Point, Mississippi. The company has installed the sulphate system of the Joseph H. Wallace Company by which Southern Pine slabs and edgings are converted into an excellent quality of paper.



The Markets

The market conditions continue steady in the news print line and a better demand is reported in many centres. The recent stir over the trouble with Mexico had the effect of increased orders from across the border and some of the Canadian mills, who had surplus stocks, were successful in cleaning them out. Prices continue firm and the outlook is good. Canadian plants, it is estimated, are now supplying about one-fifth of the entire consumption of news print in the United States and by the end of another year it is expected that fully one-fifth of the demand will be catered to by the Dominion. The total Canadian output at present is 17,000 tons and by this time next year, it is predicted, that production will reach at least 2,200 tons, the biggest factor being the new plant of the Abitibi Power and Paper Co., which alone will yield 225 tons, while new machines and additions to other mills now underway will make up fully three hundred more tons. Book and writing mills are busier than they have been for some time with orders from catalogue houses. Still the general tone of business is quiet and orders are smaller and fewer than a year ago. The jobbing line is not brisk and, although the summer season business has resulted in an augmented demand for paper bags and light wrappings, the trade in other lines is quiet. On Kraft paper particularly the bottom has all fallen out of the market and price-cutting flourishes. In ground wood there are a number of inquiries and if water conditions get much worse across the line and in Quebec there may be a shortage in this line before many weeks. The chief anxiety now is in regard to power and already some mills are able to grind only part time. In relation to sulphite the state of things keeps up very well and stocks on hand are not very large. The demand is, however, patchy and very few big plants across the line have yet placed contracts for next year. There is a disposition in all branches of the pulp and paper trade to hold back. Prices for mechanical and sulphite pulp remain unchanged, and in the paper stock and rag market there are only a few lines moving. Notwithstanding the cry of depression, one of the leading book and writing paper manufacturers remarked this week that although their output had been increased by nearly twenty per cent. during the year, the falling off in business in the last eight months had been less than ten per cent.

The following prices prevail, f.o.b. Toronto:

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.05 to \$2.20 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.50, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.

Manila, B., \$2.50 to \$3.00.

Manila, No. 2, \$2.85 to \$3.50.

Manila, No. 1, \$3.25 to \$4.00.

Un glazed Kraft, \$3.75 to \$4.50.

Glazed Kraft, \$3.90 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$16.

Ground Wood, \$21 to \$23, delivered in United States.

Sulphite (unbleached), \$41 to \$43, delivered in Canada.

Sulphite (unbleached), \$42 to \$44, delivered in United States.

Sulphite (unbleached), \$55 to \$58, delivered in Canada.

Sulphite (bleached), \$56 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90, f.o.b., Toronto.

No. 1 soft white shavings, \$1.75.

No. 1 mixed shavings, 60c.

White blanks, \$7½c. to 90c.

Heavy ledger stock, \$1.40 to \$1.50.

Ordinary ledger stock, \$1.15.

No. 2 book stock, 45c. to 50c.

No. 1 book stock, 70c. to 75c.

No. 1 Manila envelope cuttings, \$1.10 to \$1.15.

No. 1 print Manillas, 60c.

Folded news, 45c.

Over issues, 50c.

No. 1 clean mixed paper, 25c. to 27½c.

Old white cotton, \$2.50 to \$2.75.

Thirds and blues, \$1.30 to \$1.32½.

No. 1 white skirt cuttings, \$5.00.

Black overall cuttings, \$1.75.

Black linings, \$1.75.

New light flannelettes, \$4.75.

Ordinary satinet, 75c. to 80c.

Flock, 90c.

Tailor Rags, 70c. to 75c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.

Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.

No. 1 Book, 5¼c. to 6c. per lb.

No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.

No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.

Writings, 5c. to 7½c.

Sulphite Bond, 6½c. to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons, \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.

Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.

B. Manila, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.

No. 2 Manila, car lots, 3.10; 5 tons, \$3.20; 2 tons,

\$3.40; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manila, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila. B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground woods, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

Special to Pulp & Paper Magazine).

New York, May 26, 1914.

Movement in the bleached and unbleached sulphite markets has been confined to normal shipments through contract channels to consuming centres. Prices of bleached fibre abroad are firm, while the feeling here is that unbleached values will go still lower. Sulphate and Kraft have been fairly active in spot lots at 1.80c. to 1.85c. Rags have been in better demand than for some time, with most activity in the lower grades. Old bagging reflects a very sluggish tone and prices of all grades are weak.

The market for old waste papers has been quiet in the interval, with some falling off in prices. The higher grades of hard shavings are in fair demand at 2.40 to 2.50 a hundred pounds and No. 1 soft white shavings are quoted at 2.10c to 2.20c, a hundred pounds. There has been some wide differences of opinion among certain old waste papers regarding values of some grades. Overissue news is handled more or less directly, but there is one dealer who handles large quantities and is selling them at 67½¢ a hundred pounds. Strictly folded news has been quoted at 45c to 50c a hundred pounds for clean papers. Some dealers have complained about this value, as they say the best price they could get is 42½¢, a hundred. Investigations reveal that some of these papers were accepted and were not worth more than 42½¢. Some grades of clean named papers have sold in the local market as high as 75c a hundred, and poor mixed papers have sold as low as 20c. A fair market price is as indicated by leading dealers in the city at 30c. to 40c a hundred for this grade. Flat stock has been in fairly good demand and values are unchanged. Board strips have been sold by some dealers at 32½¢, a hundred for car lots. There is an exceptionally low value but it is possible that no money was made on the transaction. Packers are asking in most cases as much as 75c for this grade of paper stock.

Pulp.

Ground Wood, No. 1, \$20.00 to \$24, delivered.

Ground Wood, No. 1, \$20 to \$24, delivered.
 Ground Wood, No. 2, \$15 to \$17, delivered.
 Unbleached sulphite, dom., 1.90c to 2.20c, delivered.
 Unbleached sulphite, imptd., 1¾c. to 2c., ex. dock, New York.
 Bleached sulphite, domestic, 2.80c. to 3c., delivered.
 Bleached sulphite, imptd., 2.60c. to 2.90c. ex. dock, New York.
 Easy Bleaching, imptd., 2c. to 2.20c., ex. dock, New York.
 Unbleached sulphite, imptd., 1.75c. to 2.10c., ex dock, New York.
 Bleached sulphite, imptd., 2.60c. to 2.80c., ex dock, New York.

Paper

Business in general in this section reflects a healthier tone and more activity than for some time. The securities market has been more active than for several months. Large investment transactions have been closed and stock quotations have advanced. There has been a continuous state of hand to mouth buying and no one has carried any advance stocks on hand from jobber to retailer. It is not unlikely that there will be a marked improvement in all lines of business in the near future. The condition of the paper business at present is something entirely new to manufacturers who have been in the industry for many years. Their opinion is that there will be a good demand for all grades of paper during the summer months when water supplies are likely to be low and there will be difficulty in making paper enough to meet the demand. Men who visited mills and the trade all over the country report that they found very low stocks on hand among jobbers. Jobbers admit that they have cut greatly into their reserve stocks in supplying the small orders that have come to them. Printers have laid up no stocks to speak of and all the way along the line of demand there is a request for prompt delivery on small orders. Printers wait until they have an order on hand and then come into the market for paper with the statement that they do not need any more than a small quantity. Consumption has gone along steadily and the summer must necessarily bring a good demand for all grades. This is a state that some report never to have occurred before. It will undoubtedly bring better prices for all grades, as there will be more expense curtailed in the production of paper. The trial of a notorious criminal case in the New York Courts caused the metropolitan dailies to print large editions and many tons of news were consumed in the interval. The prices of all grades of news reflect firmness with an upward tendency. As this month is one of the quietest months in the year of the book paper manufacturing industry there has been a rather quiet movement of all grades of book papers. Coated papers are firm in price, but the demand is rather quiet. Wrapping papers have been moving in fairly good way in all grades from jobber to consumer. Business among manufacturers, however, has not been very active. Jobbers have been cutting down their reserve stocks to meet the demands in small lots made on them. Krafts are rather quiet and values low. The tissue market is quiet and very weak. The specialty lines have been in good demand all the year and most manufacturers have made good money in them. Paper bags are firm in price but the demand is poor. Toilet papers and paper towels have been in fair demand. Cigarette papers have been in active demand and values have been firm. Hangings have been in good inquiry and values fairly high. Roofing papers have been in good demand on account of spring building.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
 News, side runs, \$2 to \$2.10 f.o.b. mill.
 News, sheet, \$2.25 to \$2.30 f.o.b. mill.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13½c. to 17c., del. east of Miss. River.
 Writing paper, extra fine, 11c., del. east of the Miss. River.
 Writing paper No. 1, fine, 9c., del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c., del. east of the Miss. River.
 Writing paper, engine sized, 4½c. to 8c., del. east of the Miss. River.
 Bond paper, 5c. to 24c., delivered east of Mississippi River.
 Ledger paper, 8c. to 30c., delivered east of Mississippi River.
 Linen paper, 7c. to 18c., delivered east of Mississippi River.
 Manila jute, 4½c. to 5½c., delivered.
 Manila, wood, \$2.40 to \$3.00, delivered.
 Kraft, No. 1, \$3.50 to \$3.75 f.o.b. mill.
 Kraft, No. 2, \$3.25 to \$3.50, f.o.b. mill.
 Boxboards, news, \$30 to \$33 per ton, delivered.
 Boxboards, chip, \$28 to \$31 per ton, delivered.
 Boxboards, straw, \$28 to \$31 per ton, delivered.
 Wood pulp board, 42.50 to 45 per ton, delivered.
 Tissue, white, cylinder, 40c. to 42½c., delivered.
 Tissue, fourdrinier, 47½c. to 50c., delivered.
 Tissue, jute Manila, 40c. to 41½c., delivered.

SCANDINAVIAN WOOD PULP MARKET

The Swedish export paper, "Svensk Export," states in the April number:

The wood pulp market has been quiet on account of the many holidays, but the tendency is firm. There is not much inquiry for mechanical, and cellulose is dull. That the paper makers under the present situation are careful in regard to their purchases of both mechanical and chemical pulp is only natural. The United States market ought to give a strong assistance to our producers, if only the sales could be arranged in a satisfactory manner for them.

As it now goes, the development of our export to America only shows a small progress in spite of the now ruling free import to the United States.

Latest Quotations.

In England	£	s.	d.	£	s.	d.	
Sulphite—pulp, bleached	11	15	0	to	12	5	0
" " easy bleaching	8	15	0		9	2	6
" " strong	8	0	0		8	2	6
Sulphate " easy bleaching							
" " lime	7	12	0		8	0	0
" " kraft	7	7	6		7	15	0
Mechanical pulp, moist	2	8	0		2	15	0
Mechanical pulp, dry	4	5	0		4	10	6

All per ton English c.f.i. the east coast of England.

In France—	Francs.	Francs.
Sulphite—pulp, easy bleaching 1me..	23.00	to 24.00
" " strong	20.00	21.00
" " bleached	31.75	34.00
Sulphate pulp	21.00	22.00
Mechanical pulp, moist	11.00	12.00

Mechanical pulp, dry 12.50 13.00
 All per 220½ lbs. c.f.i. Rouen.

The Swedish quotations are per ton English net f.o.b.

Mechanical, moist, white pulp	\$ 8.00	to \$ 8.80
Mechanical, dry, white pulp	19.76	20.80
Sulphite, 1st, easy bleaching	38.67	40.00
Sulphite, 1st, strong	34.67	36.00
Sulphate, easy bleaching, ordinary..	33.33	34.76
Sulphate, strong	32.67	33.87

FUTURE SALES IN SWEDEN.

It is said that a contract has been made for delivery during 1914 and 1915 of wet, white pulp at \$9.04 net f.o.b. Baltic port including customary agent's commission. This is indeed a very good price if compared with what has recently been accepted from Norway. However, the tendency of this market is not stronger and the business passing is still very small.

As to unbleached sulphite the sales during the last weeks have only been for small, prompt parcels, which seems to indicate that stocks at the paper mills are very small and that deliveries are wanted, although the spring shipments from the Baltic have already been dispatched. Prices are unchanged, firm.

Prices for sulphate for delivery during the present year are firm and favorable for sellers, but for 1915 and the following years very low prices must be accepted on account of the large increase of the production which will then take place.

NORWEGIAN PROSPECTS.

The Norwegian trade paper "Farmand" writes in the April 8 number:

The sales of mechanical wood pulp for prompt shipment, which have been made from Norway since the beginning of the current year, amount in the aggregate to a considerable quantity, and it would seem, that they have sufficed to clear the stocks, which have been accumulating at the mills as a consequence of the exceptionally plentiful water supply of this winter. This week it has been found difficult, not to say impossible, to fill an order for 3,000 tons, the 6,000 tons which we reported last week having exhausted the available stocks.

No business is reported in cellulose.

Under date, April 18, appeared the following:—

Stocks of mechanical wood pulp in Norway have been within a very small compass. As there are still inquiries from the continent prices have hardened a little, but without any quotable change.

Sales of 1,000 tons of sulphate and 2,000 tons of sulphite-cellulose have been reported this week at current prices.

In the April 25th number, there appeared the following:

Both Norwegian and Swedish mechanical wood pulp mills appear to be practically cleared out for prompt, and as there are inquiries for the continent it ought to be possible to obtain somewhat better prices, but under the wretched condition, which still rules in the paper trade, paper makers naturally try to buy their principal raw material, wood pulp, as cheaply as possible, and it is therefore difficult to arrange business. Cellulose is inactive.

Wood Pulp Industry of Sweden

As direct inquiries from Canadian pulp mills are frequently received in regard to the situation of the

pulp market in Sweden, the following translation is taken from the Norwegian official journal, "Meddelelser fra Norges Opplýsningskontor for Naeringsveiene, for April 25, may be of interest:—

The Swedish pulp industry is making rapid progress and plays an ever larger role in the trade balance of the country. The export from Sweden during 1913 was, of mechanical moist, 580,300,000 lbs., as against 479,020,000 lbs. in 1912; of mechanical dry, 129,820,000 lbs. during 1913, against 126,390,000 in 1912; of chemical dry, 1,371,900,000 lbs. during 1913, against 1,360,150,000 in 1912; of chemical moist, 127,600,000 lbs. in 1913, against 114,400,000 in 1912. This indicates quite a rapid rise throughout the whole line.

The Pulp Market.

In regard to the different kinds of pulp, the market has shown a somewhat different situation for mechanical and chemical.

At the commencement of 1913, the situation for mechanical pulp was on the whole satisfactory. The price for moist pulp was \$9.60 to \$9.87 per ton English f.o.b. the west coast, and \$9.20 to \$9.47 per ton f.o.b. Norrland coasts including 3 per cent. agent's commission. For the dry pulp, the price varied from \$20.80 to \$21.03 per ton f.o.b. the west coast, and \$20 to \$20.27 f.o.b. Norrland coast, including 3 per cent. agent's commission. Meanwhile the supply of water at the mills increased during the winter, so that they could work up to their capacity, which caused a rapid increase of the stocks. The prices, therefore, dropped during the spring and reached their lowest point in the summer, when moist was quoted at about \$8.37 to \$8.64 f.o.b. the west coast, and from \$7.73 to \$8 f.o.b. Norrland harbors, including commission.

In the late summer, drought prevailed, and the prices rose as a consequence to \$9.20 to \$9.47 f.o.b. the west coast and \$8.67 to \$8.94 f.o.b. Norrland ports during November. Prices remained at this point until the close of the year.

The progress of the mechanical pulp industry in Sweden is indicated in the following figures, which show the production both for export and for the home consumption:—

	Tons English Moist Weight.
1893	122,000
1898	258,000
1903	330,000
1908	428,000
1913	about 675,000

Of the production in 1914 at the close of the year 1913 about 75 per cent. was placed.

For cellulose, the market was at the commencement of the year 1913 unusually favorable, and the strong increase in the price from 1912 continued also during the first quarter of 1913. In the beginning of March the prices for easy bleaching sulphite were up to \$42.67 to \$44.40 net f.o.b. and for strong sulphite from \$38.07 to \$40.00 net f.o.b.

These high prices, however, later in the summer brought a collapse, as the paper industry proved itself unable to keep pace with these prices and to supply themselves at these rates. Otherwise the hausse had only a limited consequence, as the English paper mills during the low prices of 1910-11 had secured pulp for several years ahead. The increase in the price, therefore, resulted in business stagnating and the purchasers largely restricted their immediate wants. The sales to

the United States, which next to England, is the largest customer of Sweden in this line, also were partly stopped on account of the preparations for the revision of the United States customs tariff. The prices thus during the summer were ultimately depressed. At the close of the year 1913 some improvement was noticed, as the statistical information shows a decided increase of the stocks of the cellulose mills. Of the production for 1914 probably more than 80 per cent. was contracted for at firm prices.

Development of Cellulose Industry

The development of the cellulose industry of Sweden has been strong and rapid. Several new mills have been started during the later years and a number of the older ones have increased their production.

The total production in Sweden of cellulose has been:—

	Tons English Dry Weight.
1893	about 54,000
1898	133,000
1903	272,000
1908	537,000
1913	850,000

The export of cellulose from Sweden has risen in the same proportion:—

	Tons English Dry Weight.
1893	43,663
1898	81,568
1903	233,819
1908	381,344
1913	653,500

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PUBLIC NOTICE is hereby given that on **WEDNESDAY, August 5th, 1914, at 10 o'clock A.M.**, the Timber Limits herein-after mentioned will be offered for sale by Auction without reserve, at the office of Messrs. Larue & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec:—

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182	River St. Jean N.E. Branch No. 2	18
183	River St. Jean East Branch No. 3	20
184	River St. Jean, No. 7	12
185	River St. Jean, No. 8	12
186	River Salmon & Tribut River St. Jean	34
187	River Magpie, No. 3	32
188	River Magpie, No. 4	32
189	River Magpie, No. 5	32
190	River Magpie, No. 6	32
191	River Magpie, No. 7	32
192	River Magpie, No. 8	32
193	River St. Jean, No. 1	24
194	River St. Jean, No. 2	24
195	River St. Jean, No. 3	23
196	River St. Jean, No. 4	18
197	River St. Jean, No. 5	20
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The Function of the Pulp and Paper Magazine

The pulp and paper industry at the present time is undergoing tremendous changes. Within the last decade there has been in Canada an increase of ten fold, and in the last year there has been practically a doubling, of exports of paper. Next year, it is expected, there will be 30 per cent. more paper made in the Dominion than at present. Water powers are being developed, electrical transmission is being extended, and mills and machinery are being rapidly improved. When the skill of the individual paper maker has to be spread over hundreds of tons of product, where before he counted in units or tens, when hundreds instead of scores of men are employed in single mills, and when millions of dollars of capital are involved, there comes the urgent necessity to apply the most exact and invariable principles in the process of paper manufacture. Science, which is defined by some authorities as "classified knowledge," is entering at every point. The chemist, the hydraulic engineer, the heat expert, the wood technologist and many other men trained in particular branches of science are being found absolutely necessary to the conduct of the business. And among the foremost of the experts required is the man who has acquired in the dear school of experience that knowledge which is almost unteachable—the master paper maker.

Along with the development of experts in the various special lines there has come into modern industry a new principle,—or rather, there has been lent to a principle which had remained long unemphasized a new force and meaning. It is that co-operation pays.

Men have found that, except in very rare instances, there is more money, more advancement to the industry and more comfort, happiness and uplift to be derived from being free and open with competitors than in holding close the benefit of their experience.

The annual convention has taken on a new significance. "Let's all get together once a year" is the spirit of practically every industry of size and importance in America. And these conventions mean much, not only in themselves, but in that they provide a stimulus for the whole year and raise the standard on every side. At a recent convention of the Canadian Forestry Association E. T. Allen, of the Western Forestry and Conservation Association, an organization which has made most spectacular and permanent success among the lumbermen, timber owners, government and public in the Coast States of the Union, said: "The man who doesn't come to these conventions is making a big mistake. He gets stranded in a little backwater and he misses the benefit of co-operation with his fellows."

The Canadian Pulp and Paper Association stands for co-operation among the producers in this country. It is taking the lead in bringing together the men whose knowledge and influence will shape the industry in the future. Canada's pulp and paper field is practically unlimited if the proper measures of conservation are adopted in the forest. To develop men thoroughly skilled in the art and business of pulp and paper manufacture and to secure co-operation among all whose interests lie in the industry are the two problems which lie before pulp men to-day.

It is in these two fields that the Pulp and Paper Magazine hopes to be of service. "A Convention All the Year Round" will be its motto.

Already a recognized medium throughout America and in Europe, this magazine will endeavor to develop along lines of highest usefulness to the industry. Leading paper makers, chemists and other experts, it is expected, will contribute regularly, and every effort will be made to keep the magazine up to the minute in all branches of research. Further, and most important, pulp and paper makers will find in these columns a series of articles and paragraphs embodying the actual experience of mill operators. It is hoped that every man who reads the magazine will accept

a hearty welcome to use the Pulp and Paper Magazine for the purpose of giving to the industry that which he feels would be of interest. Said one well-known superintendent not long ago: "I want to know what the other fellow has found out, and I guess he wants to know what I have found out." From the log sorter and from the most expert chemist alike can come points which will be of profit and advantage.

Knowledge, experience and co-operation, as evidenced in these columns, it is hoped will provide the industry with "A Convention All the Year Round."

DETERMINATION OF LIGNIN IN SULPHITE WOOD, ETC.

By E. RICHTER, D.E., D.Sc.

(Specially Written for Pulp and Paper Magazine).

Quite a number of authors, among which are most prominent Cross and Bevan, Muller, Zeisel and Stritar, Schulze, Seidel, Klason, etc., have tried to find a quantitative analytical method to test raw material and finished product of the chemical pulp industry. Considering the benefit derived from methods allowing to check the processes and yields in other industries, it might be said that the energy spent was well worth the object and that in spite of many futile attempts, the results obtained so far are of the greatest value to the pulp maker, as well as to the paper maker.

The methods to test the percentage of pure cellulose in wood or other raw material and in such finished product as in Sulphite or Soda-pulp in general, can be divided into two classes: (1) Methods through which pure cellulose or fibre substance is isolated; and (2), methods which are also based on the inactivity of the cellulose against chemical re-agents, but which determine directly only the impurities, leaving the pure fibre material more or less unattacked. Naturally, wherever possible, a direct method is to be preferred, however, in the case of chemical pulp, the chance of separating pure cellulose in a short time without loss is very small. On the other hand, we know less of the chemical nature of the impurities or lignin matter, and it is therefore obvious that these indirect testing methods are empirical and are only valuable if they can be proved to give good results under different conditions and with different material.

Among other direct ones, Cross and Bevan introduced three indirect methods to determine the cellulose in chemical pulp or paper and, having had some experience with two of them and the one proposed by Hempel and Seidel, the author will give a short account of the results obtained and the efforts made to check them with other direct determinations, using different raw materials.

The methods used by Cross and Bevan, as described in Textbook of Papermaking, are the following:

1. The weighed substance is moistened somewhat and exposed to the action of pure chlorine gas. After a certain time the excess chlorine is expelled, water is added and the hydrochloric acid formed is titrated with soda solution. Cross and Bevan claim that a certain amount of chlorine is reduced to hydrochloric acid through the influence of the impurities and that this amount is

equivalent to the lignin contained in the sample. They also give some experiments with a few pulp samples, which seem to show the suitability of this method. They are not considering the influence of light and moisture on the chlorine itself. It is well known that chlorine exposed to light and moisture will form hydrochloric acid. It would be therefore at least necessary to exclude light; but even then, small quantities of the acid are formed, of course less the more the light is shut off from the experiment. This is, however, only one theoretical objection to the proposed method. Another practical one is the following: If the material is finely divided as is obviously necessary, the chlorine will be absorbed and absorbed by the fibres and cannot be expelled entirely without heating.

2. The second method used by Cross and Bevan is the determination of the iodine absorbed by the sample from aqueous solutions. This method is similar to those used in the oil industry, and, judging from the latter, it stood a good chance of solving the problem. Practical experiments, however, proved it to be a failure with chemical pulp.

3. The third method which was used for comparison by the author was one first proposed and tried by Hempel and Seidel. The experiments with this kind were rather difficult at the beginning, having the disadvantage of requiring a somewhat elaborate apparatus. Yet the first tests seemed to warrant a further study about it and with a small change in the conditions under which the tests were made, very satisfactory results could be obtained.

Some of the determinations of lignin with Cross and Bevan's methods and Hempel and Seidel's form follow:—

Sulphite per 10 grs. Substance formed or absorbed.

No.	Grs. Hydrochloric acid.	Grs. Iodine.	Grs. Nitrous Acid N. O ₂
1	0.215	0.241	0.143
2	0.482	0.325	0.299
3	0.365	0.181	0.161
4	0.621	0.269	0.205
5	0.231	0.219	0.198
6		0.034	0.114
		0.175	
		0.174	

The substance used in all tests was sulphite, the author not having the opportunity to experiment with different samples of soda pulp.

In regard to the practical work with the three methods, the following may be said: 1. Cross and Bevan chlorine method.—About 2.5 grs of substance were brought into a Erlenmeyer flask, and spread over the bottom in small particles. Having moistened the cellulose with steam, well purified chlorine was introduced slowly, for about fifteen minutes. The current of chlorine gas was then replaced by one of dry air. Having removed the former as well as possible, water was added and the solids filtered off. The solution was titrated with 1-10 normal alkaline and the hydrochloric acid formed, was figured from the amount of alkali used. It need not be said that the flask was kept well in the dark, as long as free chlorine was present.

2. Cross and Bevan, Iodine method.—About one gr. (occasionally up to 3 grs.) were put in a 1,000 cc. bottle with glass stopper, 25 or 50 cc. of 1-10 normal aqueous solution of iodine added and, having closed the bottle, it was left in a dark place for about 12 hours. After this time the excess of iodine was titrated with 1-10 normal hyposulphite solution. The balance being the iodine absorbed by the lignin substances.

3. Hempel and Seidel's method was used in the form these authors described it, with the exception that 5 grs. instead of 10 grs. sulphite were used per 100 cc. of 13 per cent. nitric acid, as it was found that a smaller quantity of substance was much more convenient. Since it may be rather hard to find the original publication from Hempel and Seidel, I take the liberty of giving a short description of the apparatus and the working of it.

Five grams of sulphite are well broken up and put in a so-called Drechsler's wash bottle, together with 100 cc. of nitric acid, 13 per cent. The bottle with substance is then inserted in a water bath, where it can be heated to 100° C. At the same time air is drawn through material and liquid by a suction pump. The gases evolved, mainly nitrogen oxide (NO), nitrous acid anhydrid (N_2O_3), nitrogen tetroxide (N_2O_4), some nitrogen, etc., are forced through a bulb with water, then through a long vertical absorption tube, entering at the bottom and leaving at the top, while water runs in the opposite direction, it being collected at the bottom. This is followed by a Peligot tube with little water. These three absorption apparatus serve to absorb the nitrous acid gas, while some nitrogentrioxyl might pass them. In order to collect it, too, oxygen is added from a suitable gas holder and the gases drawn through more Peligot-tubes filled with concentrated sulphuric acid.

Having assembled all the glass parts in the proper way, a test is run in the following manner:—First, the draught is put on and the water bath heated slowly. The temperature of it should rise to the boiling point of the water in about 15 minutes. From that time it is kept boiling for exactly one hour, increasing the air draught somewhat towards the end of the experiment. The aqueous solution from the first three apparatuses is then collected in a 1000 cc. flask while the sulphuric acid which served also for absorption purposes, is kept separate in a graduated 250 or 500 cc bottle. The first solution is now titrated with 1-10 normal alkali, thus testing the total acidity, and further with 1-10 normal potassium permanganate solution having some sulphuric acid present. The last titration gives the amount of nitrous acid. According to Lunge, it should be done in such a way that the solution to be tested is filled in a

burette from which it runs into the measured amount of permanganate at about 40° C. The sulphuric acid solution is titrated with permanganate only. All results are expressed by some standard, either as nitrogen or as nitrogenous acid (N_2O_3). The different amounts of one or the other, figured on 10 grs. pulp, are then equivalent to the contents of lignin in sulphite. This method at first looks to be inconvenient and laborious; however, if the apparatus is put up once and the standard solutions are made, a test does not take much more than 1½-2 hours. An example may be given how to figure the resp. amount of nitrous acid gas.

1. Aqueous solution, 1000 cc.
2. Sulphuric acid solution, 250 cc.
 1. a. 50cc used 6.8 cc 1-10 normal alkali
 - b. 29.4 cc were used for 5.0 cc of permanganate
 - e. 1.0 cc of the permanganate equalled 0.00022 grs. N_2O_3
 - a. This is equal to 0.0762 grs. KOH per 1000 cc
 - b. This is equal to 0.0374 grs N_2O_3 per 1000 cc

According to the equation $\frac{N_2O_3}{2} : KOH = 38 : 56$,

0.0374 grs. N_2O_3 are equal 0.0551 grs. KOH. These grs. alkali subtracted from the total alkali used per 1000 cc gives the amount equivalent to the nitric acid present in the solution, that is, 0.0762—0.0551=0.0211 grs KOH, which corresponds to 0.0143 grs N_2O_3 .

No. 2 solution contains 0.0095 grs. N_2O_3 in 250 cc.

All three amounts of nitrous acid added, we get—0.0143 titrated as nitric acid, + 0.0374 + 0.0095 = 0.0612 grs. N_2O_3 developed from 5 grs. of sulphite, which is 0.1224 grs. per 10 grs. pulp.

In the little table above, it can be seen that the three methods did not give equivalent results at all; upon further investigation it was found that the chlorine method differed considerably when repeated with the same material, while the iodine absorption depended not only on the percentage of lignin present, but also on the quality of the fibre material. For instance, a well-cooked and what is called a soft sulphite, showing to contain very little lignin with qualitative tests, absorbed a great amount of iodine, while samples of pulp which were called strong stock, and which contained large amounts of hardly cooked wood, gave a lower iodine figure. Considering that soft boiled pulp most likely contains larger quantities of oxy-, hydro- and hydrat cellulose for which the discriminating quality of iodine solution is often used, the negative results obtained with that reagent in the case of the lignin testing, can be understood. From the three methods there remained only the one Hempel and Seidel had proposed and it was now the question, whether it would always give the right values or not. Up to that time, only sulphite with comparatively little difference in lignin had been tested and repeated experiments gave the same results. Now, the author used a pulp containing very many impurities, and upon repetition the amounts of lignin found differed more than was permissible. Upon a close investigation it was found that with much lignin the reaction of nitric acid on the impurities became so strong at a certain temperature (70°) that some fog was formed, carrying nitric acid from the generating bottle to the absorption apparatus. With varying gas velocities this amount of mechanically transported nitric acid changed and therefore influenced the respective determinations differently. At the same time it was also found to be inconvenient to use washbottles as generators, because the heavy glass cracked, after

making a few tests. The author therefore decided to use distilling flasks with a long neck and having proved that the nitric acid fog referred to above could not be filtered off entirely by means of glass wool or asbestos, a cooler was inserted into the flask extending over the whole length of the neck. This cooler carried a small tube as air inlet inside of it, the latter reaching down to the bottom of the flask. The air tight connection between flask and cooler was made by means of a small piece of rubber.

With this improved apparatus, uniform results were obtained in all cases. A few determinations of this kind may be given:—

Sulphite XX	grs. N_2O_5
7	0.1808
	0.1788
8	0.107
	0.108
9	0.169
	0.164
Wood 10	1.057
	1.050
11	1.361
12	1.335

Until now, all tests had been made with the material, as it came from the dry or wet machine; in other words, no consideration had been paid to some of the constituents of sulphite pulp, which, although present in small quantities only, could possibly have a greater influence on the results, than was anticipated. Of course, the moisture in the samples was tested simultaneously by drying a separate part of the same sheet. In order that the nitric acid might not be diluted too much, about air dry samples were always used.

Now the influence of the pitch was determined by using 0.100 grs. ether extract. It was mixed with small pieces of pure filter paper and tested as described for pulp. The total nitrous acid obtained was 0.024 grs. Considering that 10 grs. sulphite generally contains about 0.1 gr. ether pitch, besides some alcohol-pitch and a small amount of organical water extract, it was obvious that these contents should not be neglected, if exact figures as to percentage of lignin in pulp were desired. It was therefore necessary to extract, before determining the nitric acid figure, or as it turned out to be, the percentage of lignin. Results of some tests with the modified method, after extracting the sample with ether, alcohol and water, may be given:—

No.	grs. N_2O_5
13	0.0869
14	0.1052
15	0.0939
16	0.1097
17	0.0920
18	0.1343
19	0.0753

Having found that samples of sulphite contained up to 2 per cent. ash, the last seven results and all the following have figured on ash free substance.

It was now most interesting to try this new method with wood. A block of spruce about 12 inches in diameter had been lying on a pile for several years, and when absolutely sound, was split up and an average sample was taken, as well as possible. About 40 grs. of finest powder obtained by filing the wood was then carefully extracted with ether, alcohol and

water. After drying the powder on a biscuit porcelain dish, different quantities were used for the lignin determination, as given below:—

	grs wood used per 100 cc nitric acid	grs. N_2O_5 per 10grs. subst.
1.	5.947	1.017
2.	5.544	1.034
3.	4.998	1.046
4.	4.356	1.053
5.	3.086	1.076
6.	2.537	1.067

It can be seen that the grs. N_2O_5 increase with the reduction of amount wood used, until it reaches a maximum at about 3 grs. wood. Obviously this mixture of 3grs. and 100 cc nitric acid, is the most favorable. In order to get the per cent. lignin, it was necessary now to determine which figure was equivalent to 1.076. Klason tested European spruce on cellulose and lignin, etc. and found the following results: 53 per cent. cellulose; other carbohydrates 13 per cent; lignin 28.29 per cent.; protein-substances 1 per cent.; pitch, oil, fat, ash, 4 per cent. Since, however, the wood contained so many substances besides lignin and cellulose, it was thought advisable not to use the figure of 28.29 per cent. for lignin, without having further proof that it was really equivalent to 1.076. Many experimentators have tried to solve this problem by testing the sulphite or other almost pure material on cellulose, pitch, ash, etc., and compare the difference from 100 per cent. thus obtained with their value for lignin. This way, although theoretically correct, should be used as little as possible, since the conclusions from a few per cent. lignin in pulp to large amount of it present in wood and other raw material, will change a small aberration from the ideal value into a big error.

When the wood could not be used as a raw material with a greater amount of lignin, because of its complex nature, it was necessary to look for something else. Of the many different fibre materials, only jute was available, according to the opinion of the author, since Cross and Bevan have proved in their researches on cellulose that jute contains nothing but cellulose and lignin, besides of course small amounts of pitch and ash. Therefore jute was extracted, and the lignin and cellulose contents determined.

grs nitrous acid	XX % lignin	% Cellulose	Chlo. timent lasts
0.7714		76.4	30 min.
0.7748		75.2	45 min.
Average 0.7731	20.1	75.7	25 min.
		80.9	20 min.

The per cents of cellulose were tested according to Cross and Bevan's method with chlorine. Originally Cross and Bevan proposed to make this determination in the following way:—2.5 grs. of raw material is well broken up and boiled with 1 per cent. caustic alkali solution. It is freed from liquid and subjected to the action of pure chlorine gas at ordinary temperature. The gas having acted on the impurities for some time, the latter depending on the nature of the substance, the excess of the gas is removed by a current of air and sulphurous acid. After removing the sulphurous acid, the material is boiled with a very weak solution of sodium sulphate. Having filtered off and washed, the alkali and chlorine treatment is repeated

and the substance again boiled with sodium sulphite, until all lignin matter is removed, which can be judged by the color of the soda solution. The pure cellulose fibres are then collected, dried and weighed in some convenient way. Renker has worked with this and other methods to some extent, and he found that the boiling with alkali will dissolve some of the pure cellulose. He also recommends that the action of chlorine on the fibres is done at 0°C. According to him, the last operations are bleaching with 1 per cent. permanganate solution, removing the excess of the latter with aqueous sulphurous acid and finally washing with water. He filters and dries the precipitate in a Gooch crucible, inserted in a suitable weighing glass. Glass and crucible are put in a dessicator, which contains phosphorpentoxide as a drying medium, and which can be exhausted by a suction pump.

In regard to the action of weak alkali solution on fibre material, the author was able to affirm the objection of Renker, but in a few other points I could observe different qualities. Renker washes the cellulose with sulphurous acid solution after it has been bleached and further, he recommends drying the substance at a low temperature, because if it is done at 100°—110°C, the cellulose frequently becomes dark colored, by forming oxycellulose. Contrary to this, the author has found that pure fibres do not change their color upon heating to 110°C., if the use of the sulphurous acid was abandoned. The only necessity that arises from it is, that the isolated cellulose has to be bleached with another reagent, for instance, with very dilute sodium hypochloride solution, fresh made, as the permanganate precipitates a manganoxide, which can not be dissolved, except with acid. It seems that the last traces of sulphurous acid cannot be removed by washing with water, either hot or cold, and that these traces, although infinitely small, are the cause of the discoloration that takes place, because sulphuric acid is formed. Bleaching with dilute sodium hypochloride solution left the cellulose white, even if heated for 1-4 hours. Only in places where the fibres touched the crucible wall, a little discoloration took place, owing to the greater heat there.

Then, too, it was found contrary to the observations of Renker, that the drying at ordinary temperature in the phosphorpentoxide dessicator was not complete in eight days, but took more time. It was therefore decided to heat the separated cellulose in a drying oven for about 4 hours first, and leave it in the dessicator then for about a day. The samples thus treated did not lose any more in weight when the operation was repeated.

As far as chemical reactions are concerned, the most influential factor of this method is the action of chlorine. This part of the work has to receive the greatest care, the more so, as different materials demand a different time for the reaction with chlorine. Every new kind of raw material has to be treated individually and in most cases the experimenter has to make not two, but six or more tests in order to obtain the right maximum amount of pure cellulose. Once the most favorable time for the chlorine reaction is found, it will give good results in all cases with the same material, although the physical state will also influence the result to some extent and has to be considered.

From these remarks, it will be understood that the cellulose tests for jute as given above differed considerably. Every sample of pure cellulose was then tested on lignin, ash and copper figure. The first

was done with phloroglucin solution qualitatively only. All samples were found free of lignin, with the exception, perhaps, of the last one, which had a slight yellow color, the latter possibly covering the lignin reaction. In any way, it could have been a very small amount only. The ash had to be tested, in order to be able to figure the percentage of pure fibrous material, and the copper figure was determined to show whether a possibly influential formation of oxycellulose had taken place or not. The copper figure of the above five samples of pure cellulose varied from 3.4 to 4.0, the highest figure being obtained with No. 2 sample. These copper figures seem reasonably low. In regard to the amount of cellulose, it can be claimed that 80.0 per cent will be the right quantity, since it is the maximum yield obtained with the chlorine method. Having found 0.7731 grs. N_2O_5 with the modified Hempel's method, it should be equal to 20.0 per cent. lignin. If we now figure from it the percentage of lignin with the results obtained with wood, we get 28 per cent. lignin for 1,076 grs. of nitrous acid, which is equal the amount of lignin Klason found in European spruce.

From the sulphite pulps referred to above, the percentages of lignin were figured now and at the same time the cellulose, which they contained, was isolated, according to the modified method from Cross and Bevan. The results obtained were the following:—

No.	% lignin	% cellulose	total %
31	2.2	97.4	99.6
32	2.8	97.1	99.9
33	2.5	97.3	99.8
34	2.9	97.5	100.4
35	2.4	97.2	99.6
36	3.5	96.3	99.8
37	2.0	97.8	99.8

All samples are figured on pitch and ash-free substance, and it can be seen that the results check well. Generally the total percentages are somewhat below 100, which is, however, only natural, as the cellulose test will give rather low figures. It need not be said that the resulting fibres were tested on lignin and oxycellulose, the former qualitative with phloroglucin and the latter quantitative according to Schwalbe.

Having thus found the adaptability of the modified Hempel's test, as a means of controlling the products of a sulphite mill it was desirable to make investigations on a larger scale, in order to obtain a fair knowledge of the different processes, principally of the cooking process.

There was, however, another field where the lignin test could be used with advantage, and a few examples of this kind may be given first.

At a certain paper mill it was found one day that the stock, consisting of about 55 per cent. ground wood and 45 per cent. sulphite was partly floating on the water, when flowing to the paper machine. A qualitative investigation with phloroglucin solution did not show very much. The floating stock gave a strong lignin reaction, but it was impossible to judge fairly well, how much ground wood was present. A quantitative analysis was made and gave the following results:—Etherpitch, 1.80 per cent.; alcoholpitch, 0.52 per cent.; water-extract, 0.43 per cent.; ash, 3.1 per cent.; lignin 0.2128 grs. N_2O_5 , which would be equal to 5.5 per cent.

It was obvious from the percentage of lignin present, that only a small part consisted of ground wood, while most of the substance was sulphite. According to other

experiments in a pure state, the latter contained 3.0 per cent. lignin.

Further experiments in this case showed that the fibres of the chemical pulp were covered with traces of a fatty substance, which made them partly inactive against water.

2. From a certain paper, it was claimed that it contained 50 per cent. ground wood, and the writer was asked to determine the contents. An investigation gave the results below:—Etherpitch, 1.05 per cent.; alcoholpitch, 0.35 per cent.; water extract, 0.22 per cent.; ash 12.2 per cent.; the lignin figure was 0.6994 grs N_2O_5 per 10 grs. of ash free substance. When it was not sure whether all the rosin used for sizing and partially combined with alum could be extracted with ether and alcohol, separate tests were made. According to Herzberg, 5 grs. paper were boiled with 5 per cent. caustic alkali solution, filtered, washed and the rosin precipitated from the solution with dilute sulphuric acid. From the latter it was separated with ether. The size determination gave 1.3 per cent. ether and alcohol extraction had given 1.4 per cent.

Supposing that sulphite was used which contained about 4 per cent. lignin, which is most probable, it can be figured, from the amount of nitrous acid found above, that 40.8 per cent. of it was used, while 59.2 per cent. ground wood was mixed in. Considering 12.2 per cent. ash and mineral filler, besides the amount of size and alum, the final results are:—

1.4 per cent. size, 0.22 per cent. water extract, 1.0 per cent. ash, 11.2 per cent. loading material, 35.2 per cent. sulphite, 51.0 per cent. ground wood, while according to the papermaker, 50 per cent. ground wood was put in.

3. Other papers tested with this method gave the following results:—

Etherpitch, 1.66, 0.84; alcoholpitch, 0.74, 0.86; water extract, 0.18, 0.19; ash, 1.0, 1.0; loading material, 9.8, 13.0; sulphite, 30.1, 30.2; groundwood, 56.5, 54.0.

The ash in above samples is taken as 1.0 per cent. Of course either sulphite or ground wood may contain more of it, yet generally 1.0 per cent. will come very near the true figure. From a great number of ash tests with sulphite, the author found 0.7 per cent. as being a good average, while experiments with wood gave about 0.6 per cent.

Our present methods to determine the contents of ground wood and sulphite in paper are principally qualitative or rather founded on color reactions and comparisons with standard paper samples, and they are often deceiving. Herzberg states that the phloroglucin method might give an error up to 10 per cent. regarding the contents on ground wood. At the same time it is true, of course, that with the above method errors can also be made, as it is not always known what kind of sulphite and wood has been used. Especially the former allows wide ranges in this respect. For instance, the writer had the opportunity to determine 2 per cent. lignin in some samples, while others had up to 10 per cent. impurities. No doubt, however, these were exceptions, and particularly the second kind could be recognized very easily. Any sulphite with more than 6 per cent. lignin has distinctive features under the microscope if colored with phloroglucin or other dyestuffs. Therefore, if a microscopical examination is made previous to the other tests, the chemist can easily judge about what per cent. of lignin is present in chemical pulp.

With regard to the ground wood, it might seem that a still greater variety exists. The extraction with ether, alcohol, and water, however, removes several substances which otherwise would have influenced the result to a great extent. More frequent, and therefore of more general value, are investigations of the cooking process in chemical pulp mills, and especially determinations of qualities of the resulting fibres. A few examples will illustrate it.

At a certain pulp mill in the United States the author had the opportunity to test several digesters continually during a week, and in addition, he examined every product according to the scheme explained above, which had proved its reliability in former experiments.

The results of twelve tests were:—

Digester No.	Total %	Acid Free	Combined	Hrs. Cooking	% Ether Pitch	% Alcohol pitch	% Water extract.	% Ash	% Lignin	% Cellulose
1	4.80	3.42	1.38	8	0.83	0.24	0.34	0.64	5.6	92.35
2	4.70	3.32	1.38	7	0.97	0.12	0.20	0.61	7.3	90.80
3	4.73	3.35	1.38	8	0.99	0.10	0.24	0.61	4.0	94.60
4	4.64	3.29	1.35	8½	0.92	0.24	0.25	0.61	3.2	94.78
5	4.51	3.20	1.31	8	0.88	0.20	0.28	0.66	6.2	91.78
6	4.60	3.35	1.25	7	0.50	0.44	0.21	0.60	5.7	92.35
7	4.57	3.20	1.37	9	0.70	0.29	0.19	0.58	3.6	94.51
8	4.73	3.39	1.34	8½	0.81	0.28	0.19	0.58	3.8	94.32
9	4.64	3.29	1.35	8½	0.64	0.27	0.26	0.66	5.6	92.57
10	4.73	3.35	1.38	8½	0.88	0.29	0.27	0.51	3.1	94.95
11	4.51	3.20	1.31	8	0.82	0.16	0.37	0.61	4.2	93.82
12	4.70	3.32	1.38	9	0.84	0.09	0.30	0.59	3.4	94.75

If we compare the figures for the total, free or combined acid, with the percentage of lignin present in the resulting pulp, we find that no connection between these two can be constructed whatever. In one case, No. 2 Dig., the acid and lignin is rather high, while in the other, No. 7 Dig., acid and impurities are low, and vice-versa.

The time of cooking does not seem to have any influence on the results, either.

There is relatively little change in pitch, water extract, and ash, while the lignin varies rather much. Small differences of 1 per cent. and the like, are more important in this respect, because they denote a greater change of the cooking conditions. Furthermore, if, for instance, the well kept average contents on lignin are 4 per cent., the yield per digester will be a certain one, while with the 5 per cent. impurities the output will be relatively far higher than is represented by the difference of 1 per cent.

The proprietor of the local paper at Eberswalde, a small Prussian town not far from Berlin, does his best to make his paper useful as well as instructive. Two days a week he has the General Anzeiger printed on only one side of the paper so that it can be used for wrapping up provisions without any danger of contamination from printers' ink. On these days the paper is twice as large as on ordinary days, so that the public loses nothing in the way of reading matter.

VIBRATIONS AND THEIR EFFECT ON OUTPUT

A Study of Speed in the Manufacture of Paper

By JOHN W. BRASSINGTON.

(Specially Written for Pulp and Paper Magazine).

INTRODUCTION.

The two main causes of deleterious vibrations in fast moving machinery are:

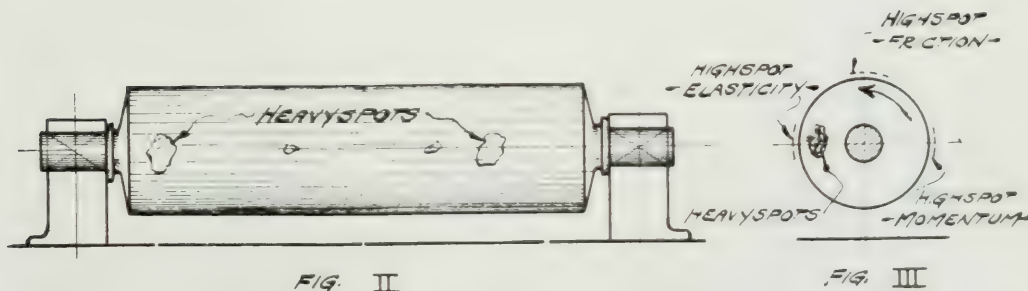
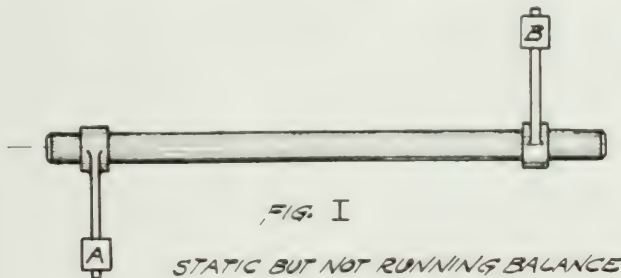
(1) The tuning of vibrations due to the intermittent torque of the driving shaft, with its period of natural vibration, together with lack of running balance of the driven mechanisms;

(2) Lack of rigidity of steel frame work of building containing the machinery, and consequent transmissions of vibrations due to reciprocating mechanisms.

When the speed of any machine is increased beyond a certain critical point, its component parts are thereby brought under the influence of laws governing vibrations; of laws governing the time of operation, that are not to be reckoned with at the slower speeds which characterized the machines that were considered speedy by the generation that is now passing.

It is always necessary in designing the drive of a paper machine to see to it that it shall be as nearly

free from vibration when in operation as it is possible to obtain such an ideal condition. The influence of the drive on the quantity of output of the machine is a factor in its efficiency which is quite likely to escape the observation of any but those who have been educated by hard knocks to the fact that the tenuous, fragile thread of paper is as often broken by the drive as it is by any other cause, when the building is sensitive enough to transmit vibratory influences. Even when the designer has carefully arranged for the necessary stiffness of the foundations upon which the several parts of the drive are to be situated; that is, when the floor beams and columns on the driving side are chosen for stiffness and vibratory resistive qualities, as well as mere strength, when the foundations of the building itself are strong and not subject to vibration by passing trains, etc.; when the shafting is amply large and stiff, and the prime mover of sufficient power, there still remains lurking for mischief, the diabolic vibrations that maintain when the speed of the machine is high enough to make the period of variation in the torque nearly the same as the period of natural vibration of the driving shaft.



ROLL BALANCE DIAGRAMS

When a shaft is transmitting a uniform torque, or twisting movement, there is a uniform or steady twist in the shaft, say, for instance, in the variable speed driving shaft. This twist is directly proportional to the transmitted torque, and if the torque varies regularly the twist also varies regularly. If the period of variation of the torque is nearly the same as the period of the natural vibration of the shaft, the amplitude of the vibrations may be very great. Every driving torque, however constant, must have its periodic variation of intensity due both to the design of the reciprocating mechanism of the driver and to the inevitable lack of absolute balance in the driven parts. Fortunately, the fact that there is a large number of parts in a paper machine causes a tendency to intercorrection amongst the component parts of it, as a palliative of inherent tendency to vibratory variation of torque. The great superiority of one machine over another is often largely a question of balance; the better the balance, the more constant the output.

Now, as machines are run at higher speeds, the superiority of the better balanced machine is the more marked, yet the mere fact that some machines can be run faster brings into being the danger of failure, due to incremental vibration, caused by the machine itself tuning with the natural vibration of the shafting chosen.

It is interesting to measure the actual amplitude of vibration in a running shaft, and an instrument for this purpose has been designed by Mr. Frahm, of Hamburg. The principle of this instrument is that if a shaft is not rotated uniformly, the distances between successive marks, made on a coupling at equal intervals of time, will not be equal. By taking into account the amplitude of twist known by experience, for any given class of work, such as for instance the drive of a paper machine, the diameter of shaft can be selected, so that the natural harmonic vibration of the selected shaft will not be in tune with the amplitude of vibration induced by the particular class of work involved, for should such prove to be the case, it is more than likely that the twin vibrations will become rhythmically incremental to each other, and actually manifest themselves in so marked a fashion as to set up injurious vibratory motions, not only in the machine being driven by it, but in the building itself. Such vibration means an increase in the order for broke for the beaters.

The problem of balancing the rotating parts of high speed machinery is most interesting and complicated. Because a body is in perfect standing balance, it by no means follows that it is anywhere near in running balance. Fig. 1 shows a shaft with weights A and B that may be in static balance, yet if this shaft is revolved at high speed, the centrifugal force generated by the two weights A and B will evolve a very noticeable vibration of the shaft. Such a case is, of course, easy to correct because we know at a glance where the unbalanced weights are, and also their radial distance from the centre line of the shaft. Figs 2 and 3 show in diagrammatic form the type of roll whose name is here on a paper machine, and such rolls, be they ever so carefully made, are never even in perfect static balance, far less are they in perfect running balance, when they first arrive in the balance department. The difficulty of the problem of balancing such a roll is that it is not possible to detect the location of the heavy parts when the roll is at rest, even when the marks are resting on half edges, and the roll is free to turn. Theory helped the practical man to solve this problem because it is a proven theorem that any un-

balanced system of rotating bodies mounted on a stiff shaft can be balanced by two weights located at proper radii, in two planes perpendicular to the shaft; of the eight factors involved, i.e., location of the two planes, amount of the two weights, angular locations of the weights and their radii, any four may be assigned at the start, and the other corresponding four obtained. The first step is to determine the high side of the rotating roll; that is done by bringing up the body to full speed and marking the high points with a selected pencil. When the roll is again brought to rest the high spots are carefully marked at the centre, or it may be more convenient to mark the centre of the unmarked or low side.

At first glance it would appear that the high spot would indicate directly the position of the heavy spot, and that the balancing weight should be placed directly opposite. Generally speaking this is incorrect, as the high spot may occur anywhere around the circumference. The three things that control the position of the high spot are—momentum, elasticity and friction of the parts in motion.

If the body rotates on an absolutely stiff shaft in bearings, that are unconstrained, and free to move without any friction, then momentum alone is under consideration; in such case the body tries to revolve on an axis through its centre of gravity. Under this condition the high spot will come directly opposite the heavy spot.

Now suppose the body rotated without momentum, on a very elastic light shaft in bearings of great rigidity; then the high spot would come directly over the heavy spot.

Again, let us suppose that the body is without momentum, that it rotates on a stiff shaft in bearings the motion of which is limited in all directions by friction. Then the high spot will come ninety degrees back of the heavy spot in a direction opposite to that of rotation. See Fig. III.

Every body in rotation is affected more or less by each of these three factors, and the location of the high spot will depend entirely on the relations between them. Since we do not know, we must experiment. When it is possible to reverse the direction of rotation, the problem of balancing is obviously simple by trial and error. When the reversal of rotation is not practicable, it is wise to apply weights of considerable size on each end in any position, making them heavy enough to outweigh the original heavy spots; by trying such weights in two or three positions, it is possible to locate the proper places for the balancing weights and comparatively simple to determine their amount afterwards. In a shop like that of a paper machine builder, the balancing of rolls is such an everyday matter that it is not considered worthy of notice.

It is, however, evident that a rational line of procedure is essential to economy in time. It is apparent that a rotating body in balance at one speed is also in balance at all speeds. The prevailing impression to the contrary is due to the fact that all balanced bodies have one or more critical speeds at which the vibration is violent, although above and below such speeds the vibrations are mild. These speeds are the speed of synchronizations treated of in the opening paragraphs of this article, the first and lowest of these speeds is the speed at which the vibrations of torque tune with the natural period of vibration of the supports, and so these two vibrations become incremental each to the other.

If the building containing a paper machine is of light construction, say only slightly stiffer in the design of its steel framing than the better class of warehouse, it will then act as a conductor of vibrations from all sorts of sources (such as pumps, engines, wind, moving of heavy trucks, etc.) to the paper machine, so perplexing and infuriating the machine tenders, who will under such circumstances, begin to believe that the machine itself is possessed by an evil spirit. This tendency of machine tenders and operators to endow the engine or machine they have under their charge with a personality of its own, is due apparently to their sub-conscious belief that environment is the chief influence in the formation of character. In comparing the rigidity of the structures in which machinery is to be placed, the writer has been tempted to believe that the designers have not always paid sufficient attention to insuring rigidity in the design of columns, and it is possibly a debatable question whether the cause of much of the troubles that have developed in steel structures is not often due to this lack of appreciation on the part of the original designers, as to the effect of vibrations on the particular type of construction they have in hand; it is possible that otherwise unexplainable troubles are sometimes due to the use of the usual column formula in figuring the strength of the struts. The Rankine-Gordon Formula, by which practically all of the column tables in our present day hand books are figured, is based on the ultimate strength and not on the elastic limit of the material in use in the columns under consideration, and so does not take care of excessive column deflections and vibrations, due to fast moving machinery.

Mr. Carl G. Barth published in the *Journal of the Association of Engineering Societies*, some years ago, an article which the writer was sufficiently interested in to transcribe in part; the note-book containing the transcription reads as follows:—

"It seems impossible to conceive a rational formula for the ultimate strength of an ideal column, for no reason can be assigned why an ideal, centrally located column, however long, should yield in any other way than a short one. Evidently, therefore, a rational column formula can only determine and fix a design of column so that the load will subject the column, if well made, to no undue stress, even though a load be applied a little out of the centre."

In Mr. Barth's formula, the permissible working stress is taken as a function of the elastic limit of the material in compression; then this is considered equivalent to allowing for an assumed eccentric displacement of the load. A factor of safety is also taken on Euler's load, for a column so long that the direct crushing tendency may be entirely neglected, as compared with the bending tendency.

Mr. Barth in this way obtains a formula similar in form, but radically different in nature, to the Rankine-Gordon formula. This type of column formula is to the best of the writer's knowledge, used by German engineers in preference to the Gordon-Rankine formula.

Should such a formula be used to determine the size of columns in mills containing machinery, there would very probably be less breakage of paper, yarn, cotton, or fragile product manufactured in such buildings. It were well to watch, lest the twin scourges of the present time, namely, the curse of commercialism and the rush of modern business, besmirch the fair escutcheon of the Profession of Engineering; the times are strenuous enough in any case to try men's souls, and it were

well that we stand together and leave no precaution unheeded, for the forces we are handling are becoming stronger and swifter day by day. Dame Nature's laws are each one simple and accurate in application, yet there are so many permutations and combinations of them that he must indeed be of vast ability who can say truthfully that he has properly arranged for all contingencies in any engineering enterprise he may have undertaken.

DUST EXPLOSIONS

That the dust of a paper mill may be highly explosive is the lesson of a study of conditions made in consequence of an accident at the factory at Turcoing, France, of M. Jules Petit. The factory was for the making of tubes or spindles of paper for use in spinning and weaving mills. The sheets of paper had to be pared down at the edges before being pasted. The work was done by a machine, and the dust was removed and fell into a chamber designed to receive it. This chamber was regularly cleared out, the workmen using during the process protected lanterns burning colza oil. They were required not to smoke. One day when the chamber was being cleaned, an explosion occurred, killing two men. The task of making a scientific enquiry into the circumstances and causes was entrusted to M. Albert Bonn, of the municipal laboratories at Lille. The cases and causes of other explosions in connection with industrial mishaps of like character were studied, and it was shown that dust explosions had been recorded in connection with coal mines, sugar refineries, starch works, and flour mills. The enquiry brought to light also what may have been the first attempt to produce an engine whose power would come from an explosion within a cylinder, now familiar in the world at large. As long ago as 1824 the experiments of one M. Niepee were described. He devised what he called a pyreolophore, which furnished motive power by a series of explosions in a cylinder provided with a piston, the material used being a mixture of organic dust finely divided. The case of the Minneapolis flour mill explosion and fire was also brought into evidence. Therein it was held that the presence in the air of organic matter extremely fine (corn pollen) formed an explosive mixture similar to that of ether or alcohol mixed with air. In another case at Corbeil, France, men engaged in clearing out the dust chamber of a flour mill saw sparks fly out of a lantern fixed on the wall and run along the walls. Then came the explosion. This was suggestive of what had caused the Turcoing accident. Experiments conducted under the auspices of the Comité Central des Houillères de France indicated that the degree of inflammability of paper dust is practically the same as that of pure coal reduced by pounding into a dust passing through 200 mesh. Paper dust is extremely inflammable and may, mixed with air, give on contact with flame an explosion in a closed space. A blow of a shovel or brush might, under some circumstances, suffice to produce the condition of danger. Lanterns should not be used in dust chambers, or, by inference, in rooms in which dust is heavy. The explosion at Turcoing is thought to be the first of its kind. M. Petit, who was a sufferer by it, has published and distributed the report upon it for the benefit of others who may be concerned. His act should be appreciated. It will spread knowledge of a danger from modern industrial operations and so help those whose duty it is to provide for the safety of operatives and buildings alike.

WHO'S WHO IN THE CANADIAN PAPER INDUSTRY

Mr. C. Howard Smith, President, Howard Smith Paper Mills.

By W. A. CRAICK.

Howard Smith came by his inclination for manufacturing and selling paper quite naturally. In one respect it might almost be said that he was brought up on paper. His father was engaged in the useful occupation of news print consumption, using each week a considerable quantity of paper in the production of a prosperous country weekly. Young Howard from his earliest recollection was accustomed to move around in an atmosphere of type, ink and damp sheets, and by degrees grew to have a certain fondness for and skill in examining the quality and testing the printing capacity of paper stock.

For something like sixty-eight years the Smith family have been running the News at St. John's, Quebec, a record that has few parallels in the history of Canadian journalism. Founded by W. W. Smith, the grandfather of C. Howard Smith, the paper was managed for the past sixty-two years by his father, E. R. Smith, whose recent death was recorded in the daily press. A third generation is now in control of the publication in the person of Mr. Smith's brother.



Howard Smith began his mercantile career by entering the News office when he was fourteen years of age. A year later he ventured forth into the wide world and took a position in the warehouse of the Canada Paper Company, Montreal, where he soon absorbed a great deal of useful information about paper. In due course he was promoted to be city salesman of the company and for some years covered the metropolis with zeal and efficiency for his employers.

The next chapter in his career as a member of the paper trade was concerned with the ill-fated Montreal Paper Mills at Sorel. This enterprise, fathered by the Hon. Louis Forget and his associates, was organized for the purpose of making paper out of the marsh grass that grew so luxuriantly around the shores of Lake St. Pierre. The mill was erected and equipped and operations were commenced, but though immense quantities of the grass were obtained and brought to the mill in masses where the staff went into the bushes it dwindled away almost to nothing and the project was a failure.

During the company's brief career, Mr. Smith was employed as salesman.

When the Montreal Paper Mills went out of business, their salesman decided that he would strike out for himself in the agency business. He had little or no capital but he possessed a good deal of nerve, and, putting on a brave front, opened an office in Montreal. He put up an attractive proposition to a number of mills and was duly constituted their selling agent. His genial manner and his willingness to oblige his customers gained him many friends and he prospered almost from the start. In a short time it became necessary to branch out into the wholesale paper business and he secured a warehouse for the purpose. From that date until the present time he has taken rank as one of the largest and most successful wholesale paper men in Canada.

As a sort of digression, about nine years ago, Mr. Smith was persuaded to take an interest in the Kinleith Paper Company at St. Catharines. He moved from Montreal to Toronto and lived for a couple of years in the Queen City, where he acted as sales manager for the Company, also holding a seat on the directorate. This work did not involve any change in his Montreal business, which went on as before. At the expiration of the two years he disposed of his interest in the Ontario Company and returned to his old home in Montreal.

Soon after Mr. Smith had got back to his former haunts, he organized a joint stock company to take over his wholesale paper business and then, as the turnover grew and opportunities for further development presented themselves, he decided on putting into effect a scheme which he had been revolving in his mind for some time. This was the erection of a paper mill to manufacture a line of high grade papers. For this purpose his company was enlarged and fresh capital secured.

The Howard Smith Paper Mill, which was erected during the winter of 1912-13 at Beauharnois, twenty-two miles south of Montreal, is justly regarded by Mr. Smith as a model of excellence in construction. To its designing and erection he devoted himself unsparingly. In his own words, he lived with the project, and the result of his efforts is today one of the finest, if not the very finest, mills of its kind in America. Construction was begun in the fall of 1912 and on May 31st, 1913, the first paper was turned out, constituting pretty nearly a record in the building of paper mills.

Designed to accommodate two machines, the Howard Smith Paper Mill, which, by the way, is the second left-dried mill in Canada, contains an 84-inch Fourdrinier machine, six 800-lb beating engines, ten 1,000-lb washing engines, one Jordan engine and one rotary bleach boiler. So far the project has enjoyed uniform success and the product of the mill has been quite up to expectations. A second paper machine will, it is said, be installed in the near future.

The man to whom credit must be given for the completion of this fine new mill is personally the acme of neatness and good taste in dress. Probably among the paper manufacturers of Canada he would be regarded

as the Beau Brummel, the one whose sartorial appearance was always correct and up to date. He is most genial in manner, a good mixer, and is popular among his associates. In his business relations he is looked upon as straightforward, capable, and reliable.

"I have done nearly everything a fellow could do and live, except go in for politics," declares Mr. Smith, when asked regarding his favorite pursuits. "Lately my mill has been the one absorbing hobby of my life. Before that I used to get in some golf at the Royal Montreal Golf Club links at Dixie and I have always been fond of horseback riding. In my younger days I had a taste for military affairs and attended the military school at St. John's, afterwards holding a commission in the old 6th Fusiliers, now the 1st Prince of Wales Fusiliers, but I gave that up years ago. I am interested in early Canadian history and have got together quite a large collection of books, but I regret that I have so little time to devote to reading."

In the formation of the Canadian Pulp and Paper Association Mr. Smith took an active interest and did good work in forwarding the organization. He was made chairman of the writing paper section, a post which he occupies with acceptability.

Ottawa Notes

Ottawa, Ont., June 10. — Lumbermen and paper manufacturers in the Ottawa and Gatineau Valleys are greatly concerned over the scarcity of water in streams throughout this district as well as in the Ottawa River itself. For some time a record lowness of level has been noticeable, and instead of improving, conditions seem to be getting only worse. A number of firms who operate along various tributaries of the Ottawa have already been obliged to close down, while Gilmour and Hughson, an Ottawa lumber firm, with mills on the Gatineau, state they will have to follow suit unless conditions improve. Not only will this mean delay in getting pulp wood to the local mills, but it will mean greatly reduced power for the mills at the Chaudiere Falls on the Ottawa River. Millowners are now preparing to face a power shortage during mid-summer.

Changes of considerable importance to the pulp and paper trade are proposed to be made in the Railway Act, which has been under consideration by a joint committee of the Commons and Senate during the past session, and will be taken up again next session. Lumbermen and paper manufacturers will unite in asking for some changes in the Act, it is learned, while they are also united in opposing one change proposed by the Government.

This is the proposition to place inland water traffic rates under the control of the Railway Commission, which now regulates railway rates. From what your correspondent can learn the proposal will probably mean better rates for the small shipper but considerably higher ones for the large shipper of timber, pulp or paper. It was urged by shippers during the preliminary hearing that in the nature of things the Railway Board would have to fix uniform rates which would mean the elimination of the special rate a large shipper can at present obtain in consideration of the size of his shipments. As their American competitors would labor under no such disability, Canadian members of the trade urged before the committee and will

again urge next session, that the proposed change would affect their ability to compete. Another objection is that it will put an end to competition among vessel carriers and consequently to competition with the railways in summer, which at present always brings down the rates of the latter.

Plans are being prepared for the erection of a new Government Printing Bureau. It will be much larger than the present structure, and will enable the Government to itself execute much work that is at present given to outside firms. The government's requirements both as to paper and printing are very large, running into millions every year. The present building is not only cramped, but is said to be unsafe, 600 tons of paper piled on an upper floor recently jeopardizing the existence of the structure.

Timber and pulpwood worth many thousands was involved in a case in which judgment was given in the Exchequer Court at Ottawa last week, that of the King vs. the Vancouver Lumber Company. Justice Gossels gave judgment upholding the contention of the City of Vancouver and the Dominion Government that the company's lease of the Deadman's Island, Vancouver Harbor, and the timber thereon held good only for a term of years, and was not a perpetual lease.

The case hinged on a deed executed in 1900 by Sir Frederick Borden, former Minister of Militia and Defence, which waived certain conditions of the lease given to the company by the Government in 1899. The judgment decided that the lease was invalid inasmuch as it had been made without authority. The matter has been in litigation for years.

The spread of the cooperative idea in forest fire protection is evidenced by the recent organization of the Lower Ottawa Forest Protective Association, Ltd. The Association now includes all the paper manufacturers of the Ottawa and Gatineau districts and represents over 6,250,000 acres of timber lands on the watersheds of the Gatineau, Lievre, Rouge, Coulouge, and Nation Rivers. The staff will comprise a manager, three inspectors and fifty rangers. The headquarters of the Association will be in Ottawa. The manager of the Association, with a view to rendering his work more effective, has been placed on the staff of the Forest Protection Branch of Quebec as well as of the Fire Inspection Department of the Dominion Railway Commission. It is also proposed to promote close co-operation with the settlers and the railways in the territory covered.

In pursuance of his recently announced policy of conserving waterpowers for the people, Hon. Dr. Roche, Minister of the Interior, has reserved all the available Dominion lands near the Grand Rapids on the River Saskatchewan until a report has determined what lands are required for power development at these rapids. The country in their vicinity is well covered with good pulp wood, and it is thought that if the river can be made to give a uniform flow power might be developed to utilize this natural resource.

MAC.

BACK NUMBERS OF THE PULP AND PAPER MAGAZINE WANTED

The publishers are anxious to secure copies of the March 15, April 1, April 15, July 1 and July 15 issues of the Pulp and Paper Magazine.

Decision in Russian Pulp Wood Case

Special to Pulp and Paper Magazine.)

Washington, D.C., June 10, 1914.

The decision of the United States Court of Customs Appeals in the case of wood pulp manufactured in Germany from pulp wood cut in Russia, which was handed down on June 1st, is of keen interest to paper manufacturers of this country. The case in question (No. 1371) was a consignment of 125 bales of bleached chemical wood pulp. Though the shipment came from Germany, and the pulp was made in that country, it was proven that the pulp wood was grown in Russia. Therefore it was the question of duty that caused the case to be taken to the Court of Customs Appeals. The shipment was assessed duty by the Collector at New York. The importers protested, and the Board of United States General Appraisers sustained the protest. The matter was taken to the Court of Customs Appeals, which court also sustained the Board of Appraisers. Judge Baron, in rendering his opinion said in part:—

"The collector of the port of New York assessed duty upon this pulp presumably under the provisions of Paragraph 406 of the Tariff Act of 1909. The importers protested, claiming free entry under the provisions of Section 2 of the Act of July 26, 1911, entitled, 'An Act to promote reciprocal trade relations with the Dominion of Canada, and for other purposes,' and the provisions of what are commonly called the 'most favored nation cases' in treaties subsisting between Prussia and other German states now composing the German Empire. The Board of General Appraisers stipulations made:

As no witnesses appeared before the Board, the case was heard upon the papers, and the following stipulations:

"It is hereby stipulated and agreed by and between the parties hereto that the wood pulp, the subject of the protest above named, was manufactured in Germany from pulp wood grown and cut in Germany and Russia, but not in Finland, and exported directly to the United States from Germany and that neither the wood pulp nor pulp wood were subject to any export duty, export license fee, or other export charge of any kind whatsoever (whether in the form of additional charge or license fee, or otherwise, or any prohibition or restriction in any way of the exportation (whether by law, order, regulation, contractual relation, or otherwise), directly or indirectly.)"

Should duty be assessed on wood pulp manufactured in Germany from pulp wood cut in Russia, was the real question which had to be decided by the Court. It appeared that neither the wood pulp nor the pulp wood was subject to any export tax or restrictions whatsoever. This involved the consideration of the Court of Section 2 of the Canadian Reciprocity Act of July 26, 1911, which reads as follows:

Sec. 2. Pulp of wood mechanically ground, pulp of wood chemically bleached or unbleached, newsprint paper, and other paper, and paper board, manufactured from mechanical wood pulp or from chemical wood pulp, and of which such pulp is the component material of other pulp, collected in the pulp, or not colored, and labeled at not more than four cents per pound, not including printing or decorated wall paper, being the product of Canada, when imported therefrom directly into the United States, shall be admitted free of duty

on the condition precedent that no export duty, export license fee, or other export charge of any kind whatsoever (whether in the form of additional charge or license fee or otherwise), or any prohibition or restriction in any way of the exportation (whether by law, order, regulation, contractual relation, or otherwise, directly or indirectly), shall have been imposed upon such paper, board, or wood pulp or the wood pulp used in the manufacture of such paper or board."

Regarding this section of the Canadian Reciprocity Act, the Court said:—

"It is agreed that, if under this section wood pulp manufactured in Canada from pulp wood cut elsewhere would be entitled to free entry, assuming the conditions and tariff status of said wood pulp and wood to be correspondingly identical with the status and condition of the wood pulp and wood in this case, it follows that the wood pulp here is entitled to free entry, otherwise it is not.

"An examination of Section 2 results in a further reduction of the issue to this single question. Does the term 'being the products of Canada' employed therein require that the pulp wood from which the wood pulp is manufactured must be cut in Canada, must be the growth of its soil."

"The Government strenuously contends for an affirmative and the importers with equal vigor for a negative answer to this question."

Before affirming the decision of the Board of General Appraisers the Court mentioned many cases that have been decided by the Courts, after which Judge Barber said:

"We proceed to a more careful consideration of said Section 2 to ascertain if possible whether Congress used the expression 'being the products of Canada' in a restricted sense as referring to products made from raw material of Canadian growth and claimed by the government, for, if so, the wood pulp manufactured from pulp wood cut in Russia is dutiable, and this examination is extended to other sections of the Act of which 2 is a part.

"The opening paragraph of Section 1 of the Act declares the duties therein mentioned shall be levied and collected upon articles that are the 'growth, product, or manufacture' of Canada, and this language is several times repeated in the Act." Continuing, the decision says:

"The word 'growth,' of course limits the merchandise which it may describe to the product of the soil, and if Congress had intended that this limitation should attach to the merchandise which was the subject of Section 2, it would naturally be expected, in view of its previous care in selecting language to express its will, that Congress would have employed in said Section some such term as 'being manufactured from wood grown in Canada.' No language of that express import, however, is to be found therein. The word used is 'products,' and these products are, in fact, manufactured articles. If, as was held in *Balfour vs. Sullivan*, supra, grain bags made here of foreign material were the manufacture of the United States, clearly wood pulp made in Canada from foreign material must be the manufacture of Canada.

"Nor, considered without regard to other portions of the Act, do we find in Section 2 any satisfactory indication that the merchandise therein given free entry is required to be a product of the soil of Canada. The merchandise itself is certain wood pulp paper, and paper board. To such thereof as is within the condition precedent in all respects free entry is given.

"This condition precedent is attached to materials only, and not to their place of origin, and the condition is that such materials shall be possessed of the free unrestricted right of export. Acid is used in the manufacture of chemical wood pulp; sizing enters into the manufacture of paper; and yet it can hardly be supposed that Congress intended these articles when employed introducing the merchandise named must also be made from raw materials whose origin was Canada. No language of the section expressly declares that the raw material must be of Canadian origin, and, unless it be so required, the pulp wood from which the wood pulp in this case was made possesses all the attributes required by the condition precedent.

"Neither do we find in the purposes to be accomplished by the section any sufficient indications of an intention to limit the meaning of the word 'products,' as claimed by the Government. Manifestly one purpose was to promote the free export of pulp wood to this country. It was also desired to encourage and promote the export to this country of the named manufactured products of pulp wood. The consumers of wood pulp, paper, and paper board were equally benefited by its free entry here whether wood from which it was produced came from Canada or some other country. Congress provided as the declared condition of such free entries that the wood from which it was made must be entitled to free and unrestricted export without declaring that the country of manufacture must also be the country of origin of the raw material, and we see no reason to read into the statutes anything beyond what we consider its plain meaning in this regard.

"In the argument it is contended by the Government that in the case of *Cliff Paper Company vs. United States*, supra, we have impliedly decided the issue here against the importers' contention. It is sufficient to say that the question here raised was not before us in that case, was not considered, and was not decided.

"The judgment of the Board of General Appraisers is affirmed."

A NEW MARKET FOR CANADIAN PULP

That Cuba offers a large and growing market for Canadian pulp and paper is the report of the Acting Trade Commissioner, A. T. Quiley, Havana. In 1912, of the total import of 337,378 tons of wood pulp and news paper, which are exempt from duty, Canada supplied only 39,005 tons. Says Mr. Quiley:

"With the large number of periodicals printed in Cuba, news paper, which enters free of duty, should be imported from Canada in larger proportion than what the statistics point out.

"There are one or two factories of paper bags in Cuba, but their output is far below the demand.

"Canada contributed in the year 1911 with 9,459 kilograms of wrapping paper out of a total of 362,566 kilograms imported by Cuba. The above figures are not in keeping with the possibilities enjoyed by Canadian manufacturers of this commodity.

"While Canada holds a certain portion of the Cuban trade, nevertheless she is far from occupying the position to which she is entitled in relation to other countries. An important drawback is found in the absence of adequate shipping facilities. With a fair steamship service and reasonable freight rates there is reason to believe that her commerce would develop to considerable proportions notwithstanding the United States preference, as the demand in Cuba for Canadian products is only withheld through lack of transport."

Felt Men Classify Rag Stock

Special to Pulp and Paper Magazine.

New York, June 13, 1914.

As reported in the last issue of the PULP AND PAPER MAGAZINE, the Felt Manufacturers' Association and the Associated Dealers in Paper Mill Supplies had some difference regarding the classification of stock by the mills and the terms of rejection. The dealers appointed a committee to make satisfactory terms with the paper men. This body drafted several amendments, the spirit of which was to give the dealer some say in the rejection of stock.

The Felt Manufacturers' Association promptly took the matter in hand and adopted the recommendations of the dealers with some slight changes and also added a new class of rags to be known as "City Dump Rags," which will cover the stock which some dealers specialize in.

J. M. Richardson, president of the association, sent a letter to the chairman of the dealers' committee, which has been circulated among local shippers. A part of the letter is as follows:

"I think that you will now thoroughly realize that it is the desire of our association to work harmoniously with the dealers of our raw material that are anxious to co-operate with us. The sooner the packers of these bales are informed that the felt mills are determined to have these evils corrected, the better it is going to be for all concerned, and I, for one, am satisfied that within ninety days you will find that it is just as pleasant and profitable to sell roofing rags as any other commodity you handle. The men who do not take the mills seriously in this last move, which is to become effective on June 8, and also the men who offer resistance to this move, for honest dealing, are certainly going to regret it before many weeks go by, as they will surely find that the mills are determined to get results this time, and end their troubles once and for all, even though it is found necessary for some of the mills to shut down indefinitely for the want of raw material."

The new classification became effective June 8 and is now as follows:

Classification of Rag Stock.

Effective June 8, 1914.

No. 1.—Roofing Rags.

Soft rags containing a percentage of wool. Satinet garments, including men's coats, pants, vests, mixed linings, seams, women's coats, socks and cloth skirts, all containing a portion of wool fibre.

No. 2.—Roofing Rags.

Cotton rags. Large and small cotton rags, including linings without seams attached, silk rags, rag carpets, print rags and stockings.

No. 3.—Gunny Bagging.

Free from fertilizer, charcoal, coal and cement sacks and chemical, lime and plaster bags.

No. 4.—Brussels and Hard Back Carpets.

No. 3.—Roofing Rags.

A.—Tailor rags, free from all rubbish and paper. B.—Tailor rags, to contain not more than 10 per cent. paper. C.—Tailor rags, to contain over 10 per cent. and not to exceed 50 per cent. paper.

No. 5.—Roofing Rags.

1. The following materials, when baled separately, can be used in the manufacture of felt, but should not be included in the above grades: Canvas, window shades, strings and buckram.

2. The above shall be free from paper (except No. 5 stock, B and C as above) and rubbish and any materials which are not suitable for the manufacture of felt paper.

3. Included in the materials not suited for the manufacture of felt paper are: Shoe cuttings, felt boots, hats, corsets, suspenders, oil cloth, matting, leather, rubber, rope, mackintosh clippings, pasted stock, wool, stones, metal of all kinds, tin cans, glass, bottles, ashes, bones, shoes, excelsior, etc.

4. We cannot agree to hold shipments of inferior grades indefinitely for adjustment, assorting or re-shipment, as our warehouse facilities and unloading platforms are of such limited capacity that it is impossible to store defective stock sent us. When stock is rejected, the mill shall notify the shipper, and such rejected stock will be held at the expense and risk of the shipper only long enough to allow the shipper to inspect the stock before it is disposed of. We want only the grades ordered and of the classification stated herein.

5. Should stock shipped us, which appears to be of grade billed, later prove upon opening the packages to be of inferior grade, or containing moisture, we reserve the right to charge and collect the difference in value when the defect is discovered.

6.—Marks.—It is necessary that each shipment, and every package in every shipment, be tagged with a distinguishing mark, including weight and grade, in order that it may be positively identified at the mill. Such marks should be clearly noted on each invoice.

7.—Invoices.—Separate invoices, accompanied by bill of lading, should be rendered invariably for each consignment or carload, with notation of order number, marks, total number of packages, grade and total weight and car number, and list of weights of each grade.

8. Shippers of stock must assume all risk of loss or delays when invoices, bills of lading and marks are not sent as requested above.

All Material Subject to the Following Conditions.

9. Rags and all material purchased on this order are guaranteed by shipper to be dry and free from rubbish or any material not suitable for making paper or felt. Stock containing moisture, rubbish or any material not suitable for making paper or felt will be rejected. Class A containing moisture will be accepted, but bought and settled for on basis of actual dry weight.

10. Your acceptance of our order constitutes agreement to the above terms.

11. We reserve the right to adjust any irregularities against subsequent shipments.

New Honor for Pulp Man

Mr. L. M. Wood, who was associated with the original issue of the Spanish River Pulp and Paper Company, Limited, with his brother, Mr. John Wood, arranging the first reorganization of this company, is the newly-elected president of the Standard Chemical Iron and Lumber Company. He began his career with the Bank of Nova Scotia at Halifax, and after being associated with financial firms, was appointed manager Dominion Bond Company, Ltd., Toronto. Mr. Wood established the present business of J. & L. M. Wood, financial agents, Toronto, in 1911.

Activities in American Association

(Special to Pulp and Paper Magazine.)

New York, June 13th, 1914.

The American Paper and Pulp Association has shown some activity recently. A live enthusiasm for the maintenance of the parent body has been shown since the last meeting of the Association last month. A meeting of the Executive Council of the Association was held at the Association offices at 50 Church Street recently, and Frank L. Moore, president of the Newton Falls Paper Company of Watertown, N.Y., was elected president. No national secretary was elected, but those in attendance were very enthusiastic over the new plan of development.

The news division has also met to amend its by-laws to conform to the new organization of the parent body and to appoint a committee to select a secretary to look after its affairs.

The Executive Council will meet again in the near future to complete all details of reorganization. The new Executive Council will be composed of three members of each division. The association will maintain its offices in the Hudson Terminal Building for the present at least, and the present force of clerks will be retained until the next meeting of the Executive Council, when it is hoped the new secretary will be put in charge.

H. H. Bishop, who has had much experience as an association worker, has already assumed his duties as secretary of the wrapping division, and B. F. Naylor, who is secretary of the writing division, will take his offices to 50 Church Street about July 1.

Mr. Moore, the new President, is considered the biggest man in the paper industry, and has a chain of honors to his credit. He was Vice-president of the wrapping paper division for two years. His work as President of the Newton Falls Paper Company has been highly commended all over the country. He is also President of the Cylinder Paper Company, President of the Empire State Forest Products Association, President of the Watertown Chamber of Commerce, and a member of the Board of Safety. His wide circle of activities keeps him busy and although the latest honor conferred upon him was designed to be a purely honorary position, Mr. Moore will make it an active one.

Mr. Moore's plan is to have representatives study the conditions of paper manufacturing in other countries and to make a constructive analysis of the attitude of foreign governments toward the paper industry. Another plan is to collect statistics regarding the cost of insurance and compensation rates in order to bring about a uniform rate of liability for paper manufacturers.

As the position of President is filled by Mr. Moore without compensation or expense to the Association, it is his earnest desire that the members will sincerely co-operate with him and make suggestions that they think will be helpful to the entire trade.

The wrapping division held a meeting at the Hotel Belmont on the following day. The main purpose of the meeting was the introduction of the new secretary, H. H. Bishop, who made a brief outline of his plan of work in collecting statistics that will be of more value than those used in the past. The division also listened to an address by Charles H. Case, an expert cost accountant of Cleveland, Ohio, on the subject of uniform costs. It is the purpose of the division to bring about a uniform system of costs for the manufacture of all grades of wrapping paper.

CLAY IN THE PURIFICATION OF MILL WASTES

In Europe, especially in Germany, great interest is being taken in the application of modern theories of colloidal chemistry to the purification of mill wastes. The colloidal properties of clays by which they are capable of absorbing liquids, and certain solid materials, to a greater extent than their own weight or volume, has been made the subject of special study by Prof. P. Rohland, of Stuttgart, who has applied his great knowledge of the subject to the correction of undesirable conditions connected with the disposal and utilization of the waste liquors of paper mills.

The remarkable property of absorption possessed by certain clays renders them capable of removing solid substances from solutions with which they may be in contact, and it is this property which Professor Rohland has utilized in the purification of mill wastes.

Professor Rohland discusses the colloidal clay purification process in recent contributions to the German technical press, notably in the *Wochenblatt für Papierfabrikation*, 18 1914, and *Zentralblatt für die österr.*

the colloidal clay purification process cannot always be employed in the same manner. In the preparation of the clay emulsion, useless components, all foreign matter such as sand, etc., must be readily removable from the colloidal clay, the volume of clay employed being considerably reduced in this way.

The chemical structure of colloidal clay is based on a widely varying composition, and the main factor is always to select the proper clay and also to determine the quantity to be added accurately and in the right manner. This applies as well to a possible supplementary addition.

Where suitable clay is used the waste liquor is first quickly clarified, the solid, minute particles being precipitated by the sinking clay. The purification of the waste liquor is effected by the absorptive property of the colloidal clay. This absorption is possible by the fact that the clay presents numerous boundary and separation surfaces to the fluid to be absorbed, in which superficial energy, superficial tension and capillarity are active. It is consequently a colloidal chemico-physical process that takes place.

To employ a rough simile, we can imagine the colloidal action of clay to resemble that of a sponge, which absorbs and retains water, but with the difference that the water can be again removed from the sponge by

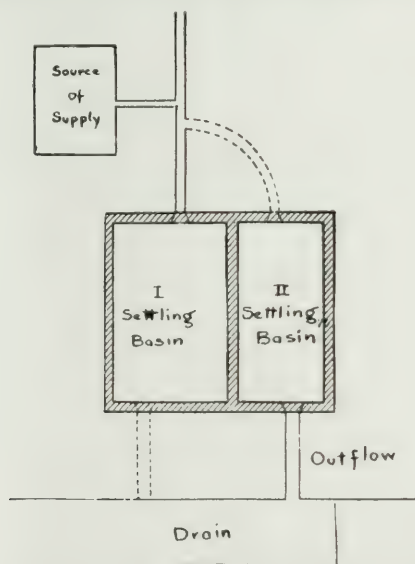


Fig. 1

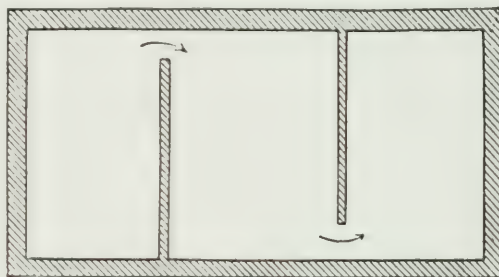


Fig. 2

pressure, while the substances absorbed by the colloidal clay, for instance the coloring substances of complex constitution, cannot be washed out again.

It can also be imagined that the colloidal clays act like semipermeable walls, the large molecules of the albuminoids, the carbohydrates, as well as the complex coloring substances, being retained by them, while the smaller molecules and the ions of salts, for example, are diffused freely and not retained.

This absorptive capacity of colloidal clay is effective on the following descriptions of substances:

1. On colloidal dissolved substances such as are contained largely in the waste liquors from paper mills, starch, dextrine, products of albumin, decomposition products, tannin, etc.

2. On coloring substances of complex constitution, as well as those that occur in nature, such as saffron and annatto; also the artificial varieties, such as aniline dyestuffs, etc.

Coloring substances of animal origin, such as carmine, are also absorbed. The supposition is that these coloring substances are of complex constitution, the colloidal principle applying to substances of this kind.

The waste liquor from paper mills contains coloring

ungar *Papierindustrie*, 4, 1914, and with a view to keeping readers of "Paper" fully advised regarding the progress of science in its relation to papermaking in all its branches we give herewith a translation of Professor Rohland's contribution to the *Wochenblatt*. He says:

As a result of various inquiries, I propose in this paper to discuss somewhat more thoroughly my colloidal clay purification process.

The waste liquors from paper mills contain a considerable quantity of minute solid constituents proceeding from whole-stuff and vegetable fibres; their color is mostly yellowish, yellow to grayish-brown, some are odorless, others give off a decidedly evil odor; the waste liquor may be neutral or have a slightly acid or even an alkaline reaction. In consequence of the diversified composition of waste liquors of paper mills

substances that originate in the wood substance or the cellulose, and are consequently of vegetable character; when colored papers are made, aniline coloring substances are found, all of these dyes and tints being absorbed by the colloidal clay so as to render the waste liquor as clear as water.

Moreover, oils, machine oil, such as frequently float on the surface of the water and are noticeable by reason of their rainbowlike iridescence, are likewise absorbed by the clay.

Disagreeable odors are also removed. Some paper mill waste liquors have a slight, others a stronger, odor of sulphureted hydrogen. It is these odors which attract the attention of the factory inspectors and cause trouble.

Finally, the colloidal clay absorbs certain ions, as carbonate and bicarbonate ions, phosphate ions, the absorption being attended by an exchange of the alkalies in the solutions for the earth alkalies in the colloidal clay.

The colloidal clay mixed with the waste liquor is allowed to undergo sedimentation in the settling basins with the minute solid particles and the absorbed substances.

These sedimentation basins are not always properly constructed. It is often found that they are simply excavations in the earth, having only a uniform depth of one yard, so that no quiet precipitation can take place, and muddiness nearly always occurs. The depth of the basins at the influx of the waste water should be at least six feet, and three feet at their discharge, so that a sloping bottom may be obtained. To promote better sedimentation and facilitate cleansing, the sidewalls should also be of sloping construction. The progressive flow from one settling basin to another must not be planned sidewise, as shown in Fig. 2, since in this way the solid particles that should have been deposited in the first settling basin are carried further with the others. It is much better that the waste liquor should flow over the cross-walls of the settling basin, these being progressively lower—by about eight inches.

Fig. 1 shows a larger classifying and purifying plant according to the colloidal clay method. At the entering canal for the waste liquor, there is a hydraulic engine that adds the clay emulsion to the waste liquor. For more convenient cleansing there are provided alternative inlets for the waste liquor into the settling basin and for its discharge into the drainage.

The settling basins are best made from stamped concrete. If, however, the waste liquor is acid, it is advisable to line the inner walls with earthenware tiles.

The colloidal clay purification process is cheap, much cheaper than processes operating with artificially made precipitants. If settling basins are available, all that is necessary for the operation of the clay refining plant is the installation of a simple hydraulic engine.

In concluding his paper Professor Rohland called attention to the fact that a new water law became effective in Prussia on April 1, 1914. Section 24 of this law makes the person who causes excessive contamination of drainage waters, by the discharge into them of waste liquors, responsible for the resultant damages, and now he needs the means of abrasing manufacturing through malicious neighbors making complaints to the authorities until they are compelled to interfere.

Paper

POINTS WORTH KNOWING.

(Continued from issue of June 1st.)

19. Burning out oil spots from the wire must be absolutely condemned, because the wires are attacked at the soiled parts or are lengthened unequally, which causes the formation of bulges. The mode of cleaning will depend on the kind of the spots. In the case of heavily sized papers alcohol or bisulphide of carbon will be used, and for oil and grease spots alkalies, benzine or turpentine. For spots due to loading materials dilute sulphuric acid should be employed.

20. As a covering for flat suction-boxes, leather should be employed for tissue papers, hard wood for medium fine and medium heavy papers and ebonite for board.

21. Peat can be very well employed for certain kinds of building felt. An admixture of 30–50 per cent. peat to second quality chemical pulp and brown mechanical wood pulp imparts to the product specific lightness and the property of absorbing moisture.

22. Sizing can be improved not only by increasing the admixture of size milk and sulphate of alumina; adding sulphate of alumina in the edge-runners or the kneader and employing size having a high percentage of free rosin enable the quantity of size added to be reduced by about one-half.

23. By means of the Oechelhauser machine M. G. paper can be obtained of a breaking-length greater than that obtained with the ordinary Fourdrinier machine. This has been determined by parallel tests with the same composition of pulp and kind of beating and other like conditions.

24. Without doubt the cylinder mould is best suited for yarn papers. As great a breaking-length as possible in the longitudinal direction, which comes almost solely into consideration, can be most readily obtained.

25. Rejected printing paper is best treated for being used again in a funnel-like vessel with alkalies, whereupon the almost pure pulp is run off below, whilst the soiled parts are removed from the surface.

26. In order to increase the life of leather belts it is not sufficient to grease occasionally. In order to make the pores of the leather able to absorb the grease the belts should be thoroughly washed with a weak alkaline solution and after drying be treated with a good grease free from acid.

CLEAN PULP FROM OLD PAPER.

According to the opinion of a writer in the *Wochenblatt für Papierfabrikation*, the washing of printed and written paper, or the conversion of old paper into new, has long engaged the attention of inventors. Increased interest has been aroused in the subject by the impending scarcity of wood. Professor Kirchner's estimate shows that out of two million tons aggregate production of paper, 200,000 tons, or 10 per cent., represents old paper worked over again. Apart from paper recovered from the household newspapers and account books form a large proportion. The process as carried out at Reutlingen, Germany, is fully described. The article concludes as follows:—

“With paper washing there opens a new era for the waste paper business and a source of national wealth. Even the spectre of a wood famine appears less threatening. So from overnight paper washing has grown from a much ridiculed problem to a branch of paper manufacture. He who has eyes to see, let him see.”

Paper Trade Journal.

SUITABILITY OF LONGLEAF PINE FOR PAPER PULP

Bulletin by HENRY E. SURFACE, Chemical Engineer in Forest Products, and ROBERT E. COOPER, Chemist in Forest Products.

Southern Pines for Kraft Pulp.

The southern pines have not, until within the last few years, been considered suitable for paper pulp. Their resinous nature is the chief drawback in most processes of paper making. The recent development in Europe, especially in Sweden and Norway, of the sulphate process, however, and the superior quality of the product made from resinous woods has turned attention to longleaf and other southern pines as a possible source of pulp in this country. These pines have long, thick-walled fibres, and also high specific gravities, implying large yields per cord, and therefore seem particularly adapted for the manufacture, at low cost, of strong wrapping papers. The waste from the lumber industry in the South suggests a source of cheap raw material.

While the sulphate process can be used in the manufacture of bleaching pulps, its principal product is an undercooked, nonbleaching, brown pulp known as "kraft" pulp, the term, a German one, signifying strength. True to its name, this pulp produces a remarkably strong paper, very resistant to wear.

Kraft papers, which may be made by the soda as well as by the sulphate process, are especially adapted for wrapping purposes. Wrapping papers stand third among the paper products of the United States, their use exceeded in amount and value only by news and book papers. In 1909 the production of wrapping papers of all kinds aggregated 764,000 short tons, with a value of \$42,296,000. The value of wrapping papers imported in 1912 was \$846,500. Complete statistics for recent importations of kraft paper are not available, but in 1908, three years after its introduction into the United States, the imports amounted to between 10,000 and 12,000 tons. In 1912 the imports of unbleached sulphate pulp from Sweden alone were approximately 21,600 short tons, and from Norway 8,400 short tons.

Manila wrapping papers, including the better imitation manilas, have generally been considered the strongest and best wearing, but the light weight kraft papers give the same service as manilas almost twice as heavy. Although strong, light-weight wrapping papers are made in this country from sulphite pulps, the imported kraft papers and papers made from imported kraft pulps have proved too formidable competitors for even the best wholly-domestic product of this kind. The immediate success and largely increasing use of kraft products has brought on the market imitations, colored to resemble the genuine, made from strong sulphite pulp or from such pulp together with ground, steamed-wood pulp. Although some of them are quite strong in the light weights, they are not equal to the genuine in other ways. The opportunity for developing an increased domestic output of kraft products from native woods is apparent.

The above-mentioned conditions led the Forest Service to conduct a series of tests at the Forest Products Laboratory, maintained in co-operation with the University of Wisconsin, Madison, Wis., in order (1) to determine the suitability of the southern pines for paper pulps; (2) to ascertain the effects of varying cooking conditions in the sulphate process of pulp making; (3) to compare the sulphate process with the soda process. Only longleaf pine has so far been used in the

tests, of which this bulletin gives the results under such preliminary analyses as have been made at this time.

Lumber Waste Available for Pulp Making.

The total stand of longleaf pine (privately owned) was estimated by the Bureau of Corporations in 1910 at 232 billion feet board measure, while for all southern pines the amount was placed at 384 billion feet. The lumber cut from these pines in 1910 amounted to 14 billion feet. The sawed lumber represents approximately one-half the volume of the log as it comes to the mill. Bark and saw-dust, which are valueless for paper making, constitute a large proportion of the waste, but it is safe to say that 20 per cent. of the volume of the log, exclusive of the bark, is lost in slabs, edgings, and trimmings. Tops and defective logs left in the woods and small logs which at present are converted into lumber with little or no profit would furnish a supply of raw material for pulp making even greater than that derived from the mill waste.

The waste wood mentioned is not as the rule the clean, clear material to which pulp mills have been accustomed. But when the soda and sulphate processes are employed, the presence of knots, pitch pockets and streaks, and remnants of decayed wood and bark are not very objectionable. The expense of handling and preparing slabs and other irregular sizes and shapes, however, is greater than for round pulp-wood, so the initial cost of such material must be low enough to offset the extra cost incident to its use.

Pulp Making Processes Applicable to Longleaf Pine.

Four or five mills are at present using southern pine mill waste for the manufacture of wrapping paper and similar products, three of which employ the sulphate process. Several other sulphate mills are either projected or in course of construction. Because of the resinous nature of the wood the preparation of paper pulp from longleaf pine is confined to the soda and sulphate processes, unless special extraction treatments are employed preliminary to cooking.

The soda process consists in digesting suitably prepared wood with caustic soda (NaOH) solution. The cooking results in dissolving the lignin and resin from one another. The action depends partly upon the direct solvent and saponifying power of the caustic soda, and partly upon the hydrolysis of the wood in the presence of water at high temperatures, forming organic acid products which unite with the alkali present. Cellulose, of which the fibres are chiefly composed, withstands the cooking action, except under very severe treatment.

The spent cooking liquor, or "black liquor," is separated from the pulp fibres and evaporated; the residue is calcined in a furnace, and the soda compounds are recovered as "black ash," an impure sodium carbonate, Na_2CO_3 . This ash is dissolved in water, and the solution is causticized with freshly burned lime; the resulting caustic soda is again used in cooking. The losses of soda occurring in the operations are made up by adding fresh soda ash (commercial sodium carbonate) previous to causticizing.

The sulphate process is similar to the soda process, except that sodium sulphide (Na_2S) is employed as a cooking chemical in addition to the caustic soda. The

sodium sulphide is derived from sodium sulphate (Na_2SO_4), which is added during the recovery operations to make up for the losses, and it is from this chemical that the process derives its name. The sodium sulphate is mixed with the black ash and subjected to a high temperature in a "smelter"; this treatment reduces it to sodium sulphide, although the reaction is not complete. The "smelt" containing sodium carbonate, dissolved in water and the solution is causticized, as in the soda process, with lime, which has, however, little action on the sulphide and the sulphate. During cooking the organic acids produced react with the sodium sulphide, as well as with the caustic soda, so that in calcining both chemicals are recovered as sodium carbonate. If desired, soda ash may be added to the smelt solution before causticizing in order to increase the proportion of caustic soda in the cooking liquors. Some mills have also found it advantageous to mix with the causticized cooking liquors some of the black liquors diverted from the recovery operations.

The soda and sulphate processes can be applied to extracted or steam-distilled chips from which resin and turpentine have been removed. Turpentine can also be obtained from resinous chips during the cooking operations by condensing the "relief" from the top of the digester. However, the turpentine is very impure, and in the case of the sulphate process contains organic sulphur compounds from which it is separated with great difficulty.

Experimental Methods—Kinds of Tests.

The tests made by the Forest Service were of two classes: (1) Autoclave tests and (2) semicommercial tests. The autoclave tests comprised several series of cooks made to determine the effects of varying the cooking conditions of the sulphate process. The semicommercial tests include cooks made by the soda as well as by the sulphate process. The semi-commercial sulphate cooks employed such cooking conditions as the autoclave tests indicated would give good results, while the tests using the soda process were made with cooking conditions that would give results comparable to those obtained from the sulphate cooks. Because the semicommercial tests show in a more direct manner the possibilities of preparing paper pulp from longleaf pine, they will be discussed before the autoclave tests.

Wood Used.

The test material consisted of longleaf pine (*Pinus palustris* Mill.) from two localities, Perry County, Miss., and Tangipahoa Parish, La. A portion of the former, consisting of edgings containing approximately equal amounts of sapwood and heartwood, was used for the semicommercial soda tests, and another similar portion of the same shipment was used for the autoclave tests. The average bone-dry weight of the wood used in these autoclave tests was 30.4 pounds per cubic foot green volume, the maximum and minimum values were 36.4 and 26.6 pounds, respectively. The wood was fairly free from resin. The remaining cooks employed two butt logs (15 and 22 inches diameter) of the Louisiana wood, including all of the sapwood and heartwood. These logs were quite resinous, but were free from knots. They had an average bone-dry weight of 35.5 pounds per cubic foot green volume. The maximum and minimum weights were 40.1 and 31.3 pounds, respectively, for the various determinations.

The material was prepared for cooking by removing the bark and sawing the pieces across the grain into

sections five-eighths inch thick, which were then split into chips about three-sixteenths to one-fourth inch by 2 to 6 inches across the grain. The chips were screened to remove sawdust, and each lot was thoroughly mixed so as to be uniform throughout.

Apparatus.

The semi-commercial cooks were made in a vertical, stationary digester consisting of a cast-steel cylindrical shell with top and bottom cones, with a capacity of about 62 gallons. The digester was fitted at the top with a "relief" or vent pipe, a pressure gauge, and a thermometer; and at the side with a gauge glass for noting the height of the liquor. The bottom was arranged for "blowing" the contents after cooking. Heat was furnished partly by passing steam directly into the digester at the bottom and partly by two steam coils regulated by admitting either more or less steam into the digester and by relieving any excess pressure by means of the top vent.

Th autoclave cooks were made in a horizontal rotary autoclave with a capacity of about 2 gallons. This vessel was made of a 6-inch steel pipe with blank flange ends, fitted with trunnions, to one of which was attached a pressure gauge. A screw-joint handhole opening in the side provided for charging. Heat was furnished by Bunsen-burner flames underneath the autoclave, and the pressures were regulated by increasing or decreasing the heat. The autoclave was not relieved during cooking, and no observations of temperatures were made. The cooked pulps were not blown, as in the case of the semicommercial tests, but the cooking vessel was quickly cooled and the contents poured out.

Procedure in Testing.

The liquor charges for the sulphate cooks were prepared by mixing caustic soda and sodium sulphide solutions of known composition, as determined by previous analyses, together with water and dry sodium sulphate. The amounts of each constituent were taken in such proportions that when the whole mixture was charged, with the chips, into the digester or autoclave, the amounts of each chemical per pound of chips (bone dry basis) was in the desired proportion, and the concentration of chemicals in the digester liquor (including the water in the chips) was of the desired degree. For soda cooks the procedure was similar, except that caustic soda was the only chemical to be taken into consideration. The general procedure in conducting the tests was as follows:

The chips to be used for a cook were sampled and weighed. By means of the sample the amount of moisture in the chips and the equivalent bone-dry weight of the charge were determined. The chips, together with the cooking liquors, were then charged into the autoclave or digester, and the vessel closed. After a cook was completed the crude pulp obtained was washed thoroughly, pressed to remove water, shredded, weighed, and sampled for determining its equivalent bone-dry weight. The pulp was then mixed with water and treated in a Hollander-style beating engine with the roll barely touching the bedplate, light brush, until the soft chips in the pulp had become disintegrated into fibers and the wet fibers had a smooth, slippery feel. The beater roll was then pressed hard down on the bedplate, stiff brush, and the beating operation continued until the pulp was suitable for making wrapping paper, as determined by its "feel." The beaten pulp was then screened through the slots (0.012 inch

width) of a diaphragm pulp screen. In all cases the screenings obtained were so small in amount that they were disregarded in the yield calculations. The semi-commercial pulps were run over a Pusey and Jones 15-inch Fourdrinier paper machine into rolls of dry paper, while the autoclave pulps were made up into sheets on a small hand mold. The papers thus produced contained the experimental pulps alone, without the addition of any other materials.

Determination of Yields and Properties.

The yield of pulp (bone-dry basis) is usually expressed as a percentage of the bone-dry weight of the chip charge, both weights being determined as explained above. When yields per cord are given they are based on a "solid cord" containing 100 cubic feet of clear wood (green volume) having a bone-dry weight of 35.5 pounds per cubic foot; or 3,550 pounds per cord.

The strengths of the papers from the semicommercial pulps were determined by means of a Mullen paper tester, five "pop tests" being made on double thicknesses of each paper. The value is expressed as a "strength ratio," which is the average of the five test values in pounds per square inch divided by the average sheet thicknesses in ten thousandths of an inch, and also as a "strength factor," which is the average of the five pop tests divided by the weight per ream of 500 sheets of paper, each measuring 24 by 36 inches. The relative resistance of the papers to wear was determined by crumpling the sheets in the hand, and all other properties mentioned, except strength, were determined by feel or by observation without the aid of instruments.

Sulphate Process.

The object of the semicommercial sulphate cooks was to secure the best quality of pulp with the highest possible yield. The severity of cooking employed depends largely upon the use for which the pulps are intended. If bleaching or easy bleaching pulps, such as are used in book and other white papers, are desired, more severe cooking treatments are necessary than if the pulps are to be used in natural-color wrapping papers. The present experiments apply more especially to the latter, for which the important properties are strength, toughness, and resistance to wear. The terms mild, medium, and severe cooking, and undercooked, well-cooked, and overcooked pulps used in the discussion are significant only with respect to the object of the tests.

Mild Cooking Treatments.

The less severe the cooking of a wood the larger will be the yield of crude pulp. However, there is a point at which the pulp will begin to lose its valuable properties for making wrapping papers. The crude unbeaten pulp from the mild cook was full of soft chips, which, while hard enough to resist the action of a stream of water under pressure could easily be picked apart with the fingers. The paper made from the beaten pulp had a strength factor of 0.50, was moderately tough, and had fair wearing properties. As a wrapping paper it would be considered of medium grade. The yield, 61.2 per cent or 2,172 pounds per solid cord, was very high, considering the quality of pulp obtained. Pulps produced under less severe cooking conditions had higher yields, but the quality was not so good, as evidenced by brittleness, lack of strength, and poor wearing properties.

Severe Cooking Treatments.

The effect of more severe cooking treatments, produced mainly by greater initial concentrations and amounts of active cooking chemicals, was evidenced by thoroughly cooked or overcooked pulps. The crude pulps were not only free from chips and shives, but also seemed to be soft and fluffy. The papers made from the beaten pulps, however, were of very superior quality with regard to resistance to wear, toughness, and strength, the strength factors being 0.91 and 0.86. Both pulps became slightly hydrated during the beater treatments, which produced a parchmentizing effect and increased the strength and toughness. Either of the papers could be rubbed or crumpled for a long time without becoming fuzzy, tearing, or showing signs of wear at the place of friction. The papers had also a soft, smooth, greasy, leather-like feel, and were light brown in color, like the imported kraft papers. The yields were rather low for sulphate kraft pulps. From 1,609 pounds per solid cord to 1,569 pounds per solid cord was the yield. Under still more severe cooking treatments longleaf pine pulps become very soft and gradually lose their strength and wearing properties.

Medium Cooking Treatments.

The above mentioned cooks show approximately the higher and lower limits of yield in the production of pulps and papers of good quality. All things considered, the cooks classed with those of medium severity, gave the best results.

The crude pulps were slightly raw and contained some soft chips, which, however, broke up in the beater. The pulp in some cases was hydrated during the beating treatment to such an extent that the paper made from it had a parchment-like appearance, the individual fibers being scarcely distinguishable from each other. This paper had good wearing properties and was very tough, with a strength factor of 0.77.

Effects of Beating.

The mechanical treatment given a kraft pulp has as important an influence on the properties of the resulting paper as the cooking treatment itself. A crude pulp which appears to be of little value can be made into strong high grade paper if the proper beater treatment is employed, while the best pulps can easily be ruined by improper beating. The use of koller gangs or edge runners preliminary to actual beating, or of stone rolls and bedplates in the beaters, and the determination by successive tests of the refining and beating treatments best adapted for a particular pulp undoubtedly would have resulted in papers of much better quality than those obtained. Nevertheless, many of the experimental papers were equal or superior to commercial kraft papers.

Soda pulps from longleaf pine tend to be soft and fluffy, even when slightly undercooked, or chippy. Proper beater treatments will remedy this to some extent, but the pulp does not become so well hydrated nor attain the same smooth, greasy feel during beating as the sulphate pulps, and the resultant papers do not show the parchmentizing effect so characteristic of the sulphate papers. On the paper machine soda stock runs "free," while sulphate stock runs "slow," provided, of course, both kinds of stock are handled similarly in the beater.

The soda papers were inferior to the sulphate papers in resistance to wear; the latter could be rubbed and crumpled for a long time without showing signs of

wear, while the former had a tendency to become fuzzy and tear under similar treatment. Even those sulphate pulps at very high yields had wearing qualities equal to the best soda pulps. There is little doubt that higher yields of good kraft pulp can be obtained with the sulphate process than with the soda process. Sulphate pulps of fairly good quality can be obtained with yields as high as 61 per cent, while the limit for soda pulps is approximately 50 per cent. With higher yields the soda pulps lose strength and toughness and become brittle. A sulphate pulp with a 60 per cent yield can be made into a medium grade of kraft wrapping paper, while a soda pulp having the same yield will produce only a very inferior grade. Considering bursting strength alone, equally strong papers can be made by either process.

The main advantage of the sulphate process over the soda process is that in the former the pulp can be very much undercooked and still produce a fair quality of paper, while a soda pulp must be comparatively well cooked before a good paper can be made from it. Moreover, the best sulphate kraft pulps were obtained with a total duration of cooking of only 3.5 hours, while in the soda tests 6 hours were required to secure the best results.

Autoclave Tests.

The autoclave tests, which, as previously explained, preceded the semicommercial tests, were made to determine the effects of varying the cooking conditions in the production of sulphate pulp. The cooking conditions investigated were:

- 1) Amounts of the various cooking chemical employed.
- 2) Cooking pressures or temperatures.
- 3) Durations of cooking.
- 4) Initial concentrations of chemicals in the digester liquors.

Aside from the chemicals normally present in sulphate cooking liquors—that is, caustic soda, sodium sulphide, sodium sulphate, and sodium carbonate, the effects of sodium chloride and sulphur in conjunction with caustic soda were studied. The tests, Tables 4 to 10, inclusive, were made in series, in any of which all cooking conditions except the one under observation were held as nearly constant as possible.

In the experiments, the effects of vary amounts of caustic soda and of sodium sulphide, and the influence of sodium carbonate, sodium sulphate, and other chemicals and combinations, as well as the effect of varying temperatures, durations of cooking etc., were noted.

The summary of conclusion from the autoclave tests were:

- 1) The effective cooking chemicals in sulphate cooking liquors are caustic soda and sodium sulphide, the former being the more drastic in its action. Sodium sulphate and sodium carbonate, which unavoidably occur in the commercial liquors, are of no assistance in cooking at least so far as the wood of longleaf pine is concerned.
- 2) Increases in the amounts of either caustic soda or sodium sulphide, or both, result in more thorough cooking. The same effect may be obtained by increasing either the cooking pressure, the duration of cooking, or the initial concentrations of the chemicals in the cooking liquors.
- 3) More thorough cooking is evidenced by decreases in yields and by lighter colored pulps until a condition of very thorough cooking is reached, after which the color of the pulp is not affected.

4) The best, or well-cooked, sulphate kraft pulps will have good strength and wearing properties, will be light brown in color, and will have a smooth, firm leather-like feel when properly beaten. Undercooked pulps are characterized by a darker brown color, brittleness, lack of strength, and poor wearing properties. Overcooked pulps are light gray in color and may have good strength and wearing properties when properly beaten, but the yield will be low. Pulps much overcooked, in addition to being light gray in color, will be soft and fluffy, with little strength.

(5) With each different combination of the cooking conditions there is a definite minimum amount of sodium sulphide which must be used in conjunction with the caustic soda present to impart to the product the high strength and good wearing properties characteristic of properly cooked sulphate kraft pulps.

(6) The use of sodium chloride in conjunction with caustic soda improves the quality of the pulp to a slight extent only. The similar use of sulphur results in pulps having properties practically the same as those of sulphate pulps.

(7) As the proportion of sodium sulphide in the digester charge is increased, the disagreeable odor produced in the cooking operations becomes more pronounced.

Practical Significance of the Experiments.

While the present experiments are not complete, they show conclusively (1) that longleaf pine is well adapted for the manufacture of natural-color kraft pulps and papers; (2) that the sulphate process of pulp making applied to this wood affords products of better quality and of higher yields than the soda process; (3) that kraft papers can be made from longleaf pine equal or superior in quality to the imported and domestic kraft papers now on the market; and (4) that the high gravity of the wood and the resultant high yield of pulp per cord give longleaf pine an advantage possessed by few, if any, other commercially important woods suitable for pulp making.

The autoclave tests indicate that there should be a certain combination of values for the variable cooking conditions which will result in the most economical method of operation. However, other factors than the variables thus far investigated must be taken into consideration in determining what this combination is. For example, the proper degree to which a pulp must be cooked will depend partly upon the cost of the beater treatment. With cheap power for beating, the pulp need not be so severely cooked as when the cost of power is high. The best concentrations and proportions of chemicals in the digester liquors will likewise depend upon the efficiency of the recovery system and the method of operating it.

NEW SALES MANAGER.

The Brunet Falls Manufacturing Co., Cornell, Wisconsin, whose business is the manufacture and sale of wood three wallboard under private brands to the jobbing trade, have secured the services of Mr. E. W. Cornell, long associated with roofing manufacture and sales, to conduct the sales of their wallboard business. This firm is shipping large quantities of their board into Western Canada where it is being received with favor by the trade.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine).

Fire starting at 9.30 on the night of May 20th, in the elevator on the second floor of the Columbus Waste Paper Company's building at Spring street and the Hocking Valley Railway tracks, Columbus, O., swept through the rear of the structure, igniting piles of inflammable material stored there and inflicting a loss estimated by Fire Chief Lauer at \$10,000. When the night watchman noticed the fire the flames were leaping from second story windows. He turned in an alarm and hurried to the stable in the rear, where three horses were kept. With the arrival of the firemen the horses were rescued just in time to escape the flames. The stable and a storeroom in the rear were destroyed. The interior of the main building, a three-story brick, was gutted and about half of the roof collapsed. The waste paper concern is owned by the Selby Company of Cleveland. The contents of the building were worth about \$35,000, a total loss, as insurance is not given on such material.

Mr. Thomas C. Bermingham, sixty-four years old, president of the Bermingham & Seaman Paper Company, dropped dead in his office in the Tribune Building, in Chicago, on May 20. Heart disease, superinduced by the heat, is said to have been the cause of the death.

The directors of the Hutchinson Boxboard & Paper Company held a meeting last month at the Commercial Club rooms in Hutchinson, an. Manager Lee Wilson met with the board and made a report of the work being done. The reports were excellent, showing that the big plant is working full time and in a prosperous condition.

Announcement has been made at Lockport, N.Y., of the resignation of Joseph H. Eilers as manager of the United Boxboard Company's local plant, and of his succession by Timothy J. Neville. Mr. Neville was employed for about ten years in various capacities at the Lockport plant before leaving there, and his numerous friends will no doubt be pleased to learn of his promotion to the position of head of the United's mills. His plans for the future Mr. Eilers is not willing to make public at the present time.

Six steamer loads, or 4,000 cords of pulpwood, consigned to the Hammernill Paper Company, were unloaded by Caulfield & Grant last week. In the opinion of the harbor master, the lumber shipments during the week have been greater than during any other similar period in years. Many thousand feet of lumber have been unloaded on the public dock at Erie, Pa.

The Treasury Department at Washington recently made a ruling to facilitate the importation of paper at the lowest possible rate of duty. Under the retaliatory provision of the paper schedule in the Underwood Tariff Act, regulations were drafted requiring the importer to disclose the name of the manufacturer and the place of manufacture of the paper, so that the customs officials might be able to tell whether the paper was entitled to the lower duty. In the case of the importation of paper by the Perkins Goodwin Co., which for trade reasons did not wish to disclose the names of the manufacturers, the Treasury Department ordered that the name of the manufacturer in this and

similar cases be waived. Customs officials were directed to accept instead the affidavit of the importer as to the place of manufacture of the paper and the province of origin of the wood from which it was made.

The Crocker Burbank & Company, Inc., one of the largest plants in the State of Massachusetts, gave the employees a pleasant surprise last week by announcing that an extra dividend of 5 per cent. of the gross earnings of the factories of the company for the year ending June 1 would be given to every man employed. The amount to be distributed will total several thousand dollars, according to the information given out by the officials. The company a few years ago established the profit-sharing system, the money to be given about Christmas time each year. The announcement came in answer to the demand that was recently made to the officials for an increase of 35 cents a day made by the paper makers.

At the annual meeting of the stockholders of the Champion Coated Paper Company and the Champion Fibre Company, held at the Champion Coated Paper Company's office at Hamilton, Ohio, old officers and directors were re-elected as follows: Champion Coated Paper Company—Peter G. Thomson, President; Peter G. Thompson, Jr., Vice-President; Walter De Randall, Secretary and Treasurer, and Peter G. Thomson, Jr., and Alexander Thomson, Harry G. Poundsford, J. C. Heoven and Walter De Randall, Directors. Champion Fibre Company—Peter G. Thomson, President; Peter G. Thomson, Jr., Vice-President; C. S. Bryant, Secretary and Treasurer; Walter De Randall, Assistant Secretary and Treasurer, and Peter G. Thomson, Peter G. Thomson, Jr., J. G. Schmidlapp, W. C. Proctor, Alexander and Logan Thomson and Walter De Randall, Directors.

Upon the application of William S. Hilles, attorney for the South Dixon Company, a Maryland corporation, in the Court of Chancery, at Williamsport, Pa., Charles H. Curtis last week, appointed a receiver for the Standard Paper Company, a Delaware corporation. The plaintiff alleged that they were creditors of the defendant company for a considerable sum which is overdue, and that the defendant company is unable to pay its debts. The defendant company, represented by Reuben Satterthwaite, Jr., admitted the allegations by the plaintiff. James Thompson was appointed receiver for the company.

While working last week in the mill of the River Basin Paper Company, at Monroe, Mich., Daniel Dushane found a diamond worth \$700 that had been lost a few weeks before in Pittsburgh, Pa. The diamond, which was a two-karat stone, disappeared from the work room of a Pittsburgh diamond company and every effort made to find it failed. The company concluded that the diamond had fallen to the floor and been swept up with the waste paper. All of the waste paper from the store was sold to the Salvation Army and the Army officials remembered that practically all of the paper they collected at the time the diamond was lost had been sold to the River Basin Paper Company. The Paper Company was notified and a \$75 reward offered for the recovery of the diamond. Du-

shane found the diamond in the sand box of the beater room. He was paid the reward.

At Washington, D.C., the Civil Service Commission has announced an examination for a chemist's aid in the Bureau of Chemistry, Department of Agriculture, to be held on July 8th. Both men and women are admitted to the positions, but most of the appointments require men for the work. Elementary chemistry, including simple problems in qualitative and quantitative analysis, chemical calculations and practical laboratory manipulations, or simple elementary physics will count as 70 per cent. of the examination and education and experience the remaining 30 per cent. Applicants for the examinations must be between 18 and 30 years old. The commission has also announced that an examination will be held on the same date for a timber scaler. The examination requires that the applicant must have had at least three years' practical experience in lumbering operations. Further, that applicants must be physically able to do hard field work in connection with scaling and logging operations. The job will pay \$90 a month.

The Wausau Abrasive Company of Wausau, Wis., is the name of a new concern started at that place last month, the incorporators being P. W. Sawyer and R. E. Chartier. The company is capitalized at \$50,000. The new concern has purchased the holdings and property of the Wausau Sandpaper Company. The new plant will begin operation in the near future with fourteen hands. The company has decided to give its entire attention to high grade abrasive papers only, and will give no time to the cheaper grades of flint papers made by its predecessor.

At the last meeting of the Board of Directors of the International Paper Company, 30 Broad street, New York, F. G. Simons was elected secretary to succeed E. W. Hyde. Mr. Simons has been with the company for some time in the capacity of assistant secretary, and will, it is stated by all concerned, shortly become more valuable to the company.

The time set for completion of the reorganization of the Remington-Martin group of paper mills in Northern New York, has been extended by Judge Ray of the U. S. Court at Watertown, before whom the bankruptcy proceedings of the group are being heard. In connection with the orders of adjudication Judge Ray has ordered that the bankruptcy proceedings remain before him, and there will be no order of reference to referees in bankruptcy for the present. The adjudication of the paper concerns will not interfere in the least with the negotiations to bring about a settlement of the troubles of the three companies. It is expected that further proceedings will be held in abeyance until some plan is evolved by the creditors' committee to put the companies on a sound financial basis and then steps will be taken towards dismissing the proceedings now pending in the United States Court. Receiver Mark S. Wilder will be continued in charge of the three companies. In the event of the creditors' committee being unable to straighten out the affairs of the companies, the usual course in bankruptcy is for Judge Ray to send the three cases to the referees in bankruptcy; the companies will file a schedule of creditors, and then general meetings of the creditors will be called to elect a trustee.

The Industrial Moving Picture Company has recently completed a featured subject comprehensively showing the paper industry, from the time the trees are cut in the forest until the finished newspaper is in the

hands of the public. The pictures were taken at the plant of the Minnesota & Ontario Paper Company, International Falls, Minn., for Peabody, Houghteling & Co., of Chicago. They will be used as a feature of the large educational campaign to be conducted by Peabody, Houghteling & Co.

The Paper Manufacturers' Selling Company of 5 Beekman street, New York City, has taken the agency for several lines of foreign pulp. A variety of grades of sulphite, both bleached and unbleached, are on hand. The company also has the agency for several grades of sulphate and kraft pulp. A special line is known as an opaque pulp, which is a bleached sulphite used in the manufacture of thin and opaque papers. The concern has also added to its line the agency for foreign manufacturers of light weight book and writing papers and glazed and machine glazed wrappings.

An application was filed in the county clerk's office at Troy, N.Y., last week showing that, by unanimous consent of the voting trustees of the Fort Orange Paper Company, at Castleton, the capital stock of the company has been increased from \$200,000 to \$400,000 and the new issue classified into \$200,000 preferred and \$200,000 of common stock. The certificates are signed by Emmon Bryant as President and M. S. Downey as Secretary of the company.

Alexander Humphries, assistant superintendent of the Mount Ida mill of the John A. Manning Paper Company, at Troy, N.Y., who recently resigned his position to go back to his home in the north of Ireland, was presented last week with a purse of \$50 in gold by mill employees; John Durrah, President of the Papermakers' Union, made the presentation speech. Mr. Humphries is only thirty years of age. He has amassed considerable money in this country for the last twelve years, and goes back to Ireland to engage in the real estate and milling business, and also to remain with his mother during her declining years.

The building of the American Paper Box Company of Grand Rapids, Mich., is being rapidly pushed along, and if everything goes as expected, it will be finished by July 1st. The plant consists of three structures. The paper box factory will occupy one portion of the plant, the Illinois-Michigan Fibre Company the second plant, and the American Corrugating Company the third structure. The building is the property of the Manufacturers Realty Company. A big tunnel will connect the various plants.

At a special meeting of the stockholders of the Robert Gair Company, manufacturers of paper goods, in Brooklyn, N.Y., it was voted to increase the preferred stock from \$2,000,000 to \$2,500,000. The present common stock is \$5,000,000. Holders of 14 of the old shares will be allowed to subscribe at par for one share of the new preferred. The additional capital will be used to finance the new buildings of the company. A new nine-story concrete fire proof building is now being occupied with the offices and some of the warehouses, although it is not quite finished with regard to interior construction.

The status of the case between the International Paper Company and its employees is embodied in the following statement recently made by Hugh Frayne, general organizer of the American Federation of Labor, who is chairman of the labor committee which has been conferring with the company. "At our last conference we submitted a proposition that all points which we failed to settle be referred to arbitration. Some time later we received a reply from the company, which was to a certain extent an arbitration proposition. But

this proposition is so widely different from ours as to what should be arbitrated that we could not undertake to pass on it, and have referred it to the unions. When we get instructions from the unions we will have another conference with the company."

Dr. G. E. Hathorne, of Bangor, Me., has been appointed inspector for the forest fire service in the territory between Norcross on the west branch of the Penobscot River and St. Francis on the St. John River. Dr. Hathorne was chief warden in the Chesuncook Lake region, where the Great Northern Paper Company has large and valuable holdings, last season. Accompanied by one deputy he will visit all the lookout stations, and each patrolman in that section, covering the West Branch, the Allagash and St. John Rivers. They will carry a complete camping equipment and supplies for a long stay in the woods.

SCHOPPER'S STRENGTH TESTER A RAPID TESTING APPARATUS.

A complete strength test with this apparatus occupies very much time in many cases. The following rapid method affords a sufficiently exact test. Cut only one strip from each direction of the paper to be tested, add the two breaking loads ascertained in kg. and divide by 3 times the weight per square metre in grammes. In order to obtain the breaking strength in metres the number obtained must be multiplied by 100,000.

Possible errors can only arise owing to only one strip instead of 5 being used and thereby obtaining an average which is not sufficiently exact. In addition, the percentage of moisture in the paper is not taken into consideration. As found by experience, the percentage of moisture in a paper with a relative percentage of atmospheric humidity of 65 per cent. fluctuates between 7 and 10 per cent. The result of the rapid test will therefore be about 5 per cent. too low. So if the required breaking-strength is determined about 5 per cent. less by the rapid test, in order to be on the safe side a complete test must be made.

The above-mentioned formula is calculated as follows—

$$\frac{\text{Breaking length R}}{\text{Length of strip}} = \frac{\text{Breaking load B}}{\text{Weight of strip.}}$$

Weight of strip = length of strip × breadth of strip (1.5 cms) × weight per square metre.

$$\text{Thus } R = \frac{B}{1.5 \text{ weight per square metre.}}$$

The average breaking length = $\frac{1}{2} (R_1 + R_2)$

$$\text{or } \frac{1}{2} \frac{B_1 + B_2}{1.5 \times \text{weight per square metre}} \\ = \frac{B_1 + B_2}{3 \times \text{weight per square metre.}}$$

For the purpose of increased accuracy it is preferable to state the breaking load B in g. instead of in kg. and the breadth of the strips in mm. instead of in cms. On

calculating according to the formula the breaking-length is then obtained directly in km. which suffices for purposes of comparison. Besides the advantage of greater distinctness the insertion of mm. instead of cms. for the breadth of the strip has the advantage that the formula can also be used for breadths other than 15mm. which actually occurs in practice. When the values are stated in g. or mm. the possibility of errors occurring in calculating the decimal places is likewise diminished, which is of special value as both breaking lengths of more than 10 000 m. and also those down to 100 m. are ascertained.

When performing this rapid test it is preferable to tear at least a second control strip out of each of the two directions of the paper. Further, the separate determination of the breaking length of each of the two directions of the paper is desirable in many cases. The error due to neglecting the percentage of moisture of the paper during this rapid test can be avoided by taking the paper approximately dry from the paper-machine. (This proposal has much to recommend it, but the paper taken absolutely dry from the machine will result in quite different values, particularly as to the number of folds and dilatation, than those obtained with the same paper moistened and calendered.) The weight per square metre is generally already determined by the sheet torn by the machine tender. Papier Fabrikant.

NEW COURSE IN PAPER MAKING.

Special to Pulp and Paper Magazine.

Bangor, Me., June 10, 1914.—A full outline of the new curriculum in pulp and paper chemistry now offered at the University of Maine appeared in an article contributed to "Paper" by Professor Ralph H. McKee, head of the department of chemistry. Professor McKee asks suggestions from the trade regarding the various courses included. He also explains briefly that inasmuch as a large proportion of the graduates of the department of chemistry are attracted to the pulp and paper industry as a life work, the University is filling a long felt want by the establishment of these courses. The strong departments of chemistry, forestry, botany, and engineering, together with the position of the University within 10 miles of sulphite, soda, and mechanical pulp mills and paper mills of all kinds make it peculiarly fitted to undertake this work.

"The curriculum is so balanced," says Professor McKee, "that a student will be well grounded in pure and applied chemistry, on the principles of which these industries are largely based; he will have a working knowledge of engineering that should enable him to understand and appreciate the mechanical details and other problems in the construction and operation of mills and machinery, and he will also have the ability to read French and German languages, which are necessary to the highest success. Students will be admitted who have completed four year high school courses including certain prescribed subjects."

The laboratories of the new courses will be in Aubert Hall, the new building for the departments of chemistry and physics. Here all the processes involved in making actual paper will be gone through, working models of actual machinery having already been installed. The courses, as the first of their kind in the country, have attracted a great deal of favorable attention from the paper trade journals.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE

Special to Pulp and Paper Magazine.

London, June 2, 1914.

During the past couple of weeks several Canadians have been paying their annual business visit to London. The visit includes a round of calls on paper and pulp men in the English capital, and in the course of another few weeks a number of Englishmen leave for their annual tour in United States and Canada. A visitation from Canadians is always appreciated, and no doubt, from a business point of view, it always proves successful.

New Paper Making Process.

As is well known, the main basis of paper manufacture in the British industry—especially the newsprint quality—is mechanical and chemical pulps, while the better-class papers are produced with the help of rags and esparto grass, the latter commonly grown in sub-tropical countries, like Northern Africa. But with regard to production from esparto grass, the difficulty heretofore has been to get a satisfactory "bleach." We are assured now that this difficulty has been overcome "as it has been as regards paper produced from mechanical and chemical pulps) and a syndicate has been formed for the purpose of developing the new process. So far very little is known of the new process, but it is reported that the commercial result is likely to have an important bearing on the esparto trade.

River Pollution.

In view of the question of river pollution now arising in Canada a recent decision is interesting as it shows how strong the law is in England on anything likely to disturb a paper mill.

River pollution is one of the crucial questions paper makers have to deal with in the British paper industry, but it is satisfactory to know that their interests are pretty well safeguarded by the Government. Messrs. Charles Marsden and Sons, Ltd., the well-known paper makers, have just contested an interesting point for the protection of their Deane paper mills, which arose on a motion in the Chancery Division of the High Court of England. It appears that two industries that are being worked on the River Deane, near to the Deane Paper Mills, are polluting the water, and Messrs. Charles Marsden asked for an undertaking that the offence be at once discontinued. This was given, but since it has transpired that during heavy rainfall Judge overflowed into the natural stream, the defendants say by no fault of theirs, and Messrs. Marsden at once applied to the High Court for protection. The judge said in his despatch he believed he was fully entitled to grant a writ of sequestration against the defendants, but he did not propose to take that extreme step. He would instead grant an injunction till the trial of the action at law between the plaintiffs and defendants, the injunction being directed against the defendants and their servants. He did so in order that there might be further remedies against persons other than the defendants.

A Sudden Strike.

From time to time references have appeared in the Pulp and Paper Magazine of the doings of the National Union of Paper Mill Workers, and other bodies affiliated to it, and a recent action is worth recording. A few weeks ago Messrs. Peebles and Son, Ltd., of London and Rishton, intimated to their mill hands that owing to the unsatisfactory working of the three-shift system—a problem they were trying to solve for the benefit of the firm, as well as for the workers—the system would be discontinued in two weeks' time and a reversion would be made to the two-shift system. This naturally meant unemployment for some of the workers, but Messrs. Peebles and Son, Ltd., if they can help it, never like to see a man unemployed, and without any cause whatever the members of the Union refused to start work, bringing to a stand-still the Art and Chromo branch of the works belonging to the firm. The officials of all the unions, without delay, held a meeting and the illegal action of their members was denounced, in fact there was sheer defiance of the union officials, as a result of which 300 hands were thrown idle, entailing severe loss to Messrs. Peebles & Son, Ltd. Eventually the dispute was settled in London, and work is now proceeding on peaceful lines. The action of the union workers, however, shows the independent attitude members of the unions adopt during a critical period, and there is no doubt they were of the opinion that the strike would receive official sanction. Another point about the strike is that this mill of Messrs. Peebles is the third within three months to revert back from the three-shift system to the two-shift system, which proves that in the British paper industry the three-shift system, of which there has been a great deal of eulogy recently—is a failure.

Newsprint.

In London all the big daily papers are falling out with each other over the question of circulation—that is, the number of copies of each paper bought and sold in one day. It is somewhat difficult to arrive at the actual circulation of one particular paper, but it may be assumed that journals like The Times, the Daily Telegraph, Morning Post, Daily Mail, Sketch, Daily Mirror, Chronicle, Daily News, and Evening News have enormous circulations daily. The Telegraph, Mirror, and Evening News have their own paper mills, and The Times as well as the Evening News, announces that there is a desperate struggle to obtain a sufficient quantity of paper of the famous hard white quality associated with The Times. An unusually large supply of paper was manufactured by W. V. Bowater, Ltd., and London Paper Mills Co., Ltd., Northfleet Paper Mills, Albert E. Reed and Co., Ltd., James Spicer & Son, Ltd., Townsend, Hook and Co., Ltd., and James Wrasley and Son, Ltd., makers of The Times paper for generations, but it is now contended that since The Times was reduced to two cents the demand for paper for it, along with the Evening News and Daily Mail,

has meant other paper mills coming to the rescue, but the difficulty is to get the right quality of paper for which The Times is renowned. The proprietors of The Times say: "It is a temporary disadvantage, and will pass away as soon as the new papermaking machines are in operation." This means, of course, that some of the mills have had to erect new papermaking machines to cope with the newsprint demand. It is also worth recording that some months ago reference was made in these notes to the necessity of a hard white newsprint in the British market, similar to that which Canada is sending into the United States market. In fact, English printers often ask for the American paper with the "good surface"—really the Canadian product—as it shows up printing work better.

Becker and Co., Ltd.

Mr. Gorge v. d. Busche, President, occupied the chair at the sixth ordinary general meeting of Becker and Co. Ltd., held on May 14th. A gross profit of £25,460 was reported, and, after allowing for various charges, the net profit stands at £10,115 on the past year's trading. Messrs. Becker are the largest wood pulp importers in England, and Mr. Fred Becker, in moving the adoption of the annual report, said that when the company £1,800,000 in orders on the books. In the first balance was first floated they showed on the prospectus sheet it was £1,900,000, and the goodwill took about 3 per cent. of the orders on the books. Today, in the 6th year, having £4,693,913 orders on the books, the goodwill had dropped down to practically one per cent. "In closing the books," he added, "on March 31st they all ways had a considerable stock of overlying goods for the benefit of their customers. Today the value of their stock in England was £310, and in France £2,730." Everything points to the fact that Messrs Becker and Co., Ltd., have had a very successful year.

Wood Pulp Imports.

The imports of wood pulp declined during April, but it is fully anticipated they will show a good rise during May. The imports were as follows for April:—

	1913	1914
	Tons	Tons
Chemical	17,674	19,584
Mechanical	42,627	31,621

January to April—

	Tons	Tons
Chemical	84,179	83,403
Mechanical	156,933	135,501

Of the mechanical 3,600 tons were received from Canada in April, compared with 1,376 tons in April, 1913, and 9,262 tons between January and April, as against 2,572 during the same period last year.

London Exhibition.

For the past two weeks a very successful exhibition of printing machinery and paper requisites has been held in London. There was a good display of dandy rolls and appliances for loading, unloading and piling papers, whilst Messrs. Bertram's, Ltd., of Sciennes, Edinburgh, showed their patent carton skellet and cardboard box making machine, which manufactures cartons and skellets finished direct from the reel of card

board at a very high speed—about 30,000 per hour. The North Cornwall China Clay Co. had their model of an old china clay works on view. Several paper making firms exhibited specimens of what their mills can turn out, and, taken all round, the exhibition was interesting throughout. Of course, it was intended mostly for printers, but the papermakers lost no opportunity in taking a part in it.

Synthetic Rubber.

A process is being developed at Handforth for the production of synthetic rubber, the basis being cellulose. Experiments are to be carried out on an elaborate scale, and to achieve this object a small corporation has been formed to finance the scheme.

TO PREVENT FOREST FIRES.

Many residents of the Laurentian country, some from points as far distant as Lac Tremblant and Huberdeau, gathered at the Montreal Amateur Athletic Association on the evening of June 4th to discuss the formation of some organization to cope with the growing menace of forest fires, which were particularly prevalent during the past month. The Canadian Northern and Canadian Pacific Railways were represented together with a number of clubs and associations with headquarters in the district affected.

The result of the meeting was the election of a committee to draw up a plan for the formation of an association to carry on the work of securing protection from fires. The methods to be adopted were not settled, but some of them were indicated in the addresses delivered by Mr. James Lawler, of the Canadian Forestry Association, and Mr. Ellwood Wilson, Chief Forester of the Laurentide Paper Company and vice-president of the St. Maurice Fire Protection Association, which guards seven million acres.

These methods include the engaging of fire rangers and the erection of lookout stations at strategic points. The work of educating the farmers and settlers throughout the region as to the danger and loss caused by carelessness will be taken up. Similar plans are being adopted by the Lower Ottawa Association which was organized a few weeks ago. An appeal to the Government for more efficient protection will also be made, the present force of fire rangers being, it is stated, insufficient and poorly distributed.

The committee appointed to go further into the matter consists of R. A. Outart, chairman; F. Whittal, secretary; A. Ayres, Col. Starke, J. R. Innes, Mr. Allen, representing the C.P.R., and Mr. Guy Tombs, representing the C.N.R.

AFFAIRS OF NORTHERN ISLANDS COMPANY.

That the creditors of the Northern Islands Pulp Wood Company, of Port Arthur, which made an assignment some months ago to G. T. Clarkson, of Toronto, will receive about 31 cents on the dollar is the statement of the assignee. The assets of the company have been sold to F. H. Macpherson, representing the Detroit Sulphite Company, which is one of the large creditors.



NEW PATENTS



PAPER MAKING MACHINE.

Clifton V. Barret, of Little Falls, N.Y., U.S. Patent No. 1,098,704, June 2, 1914.

My invention relates to paper-making machines and its purpose is to provide an improved device for more effectively transferring the web of paper from the press rolls to the first drier.

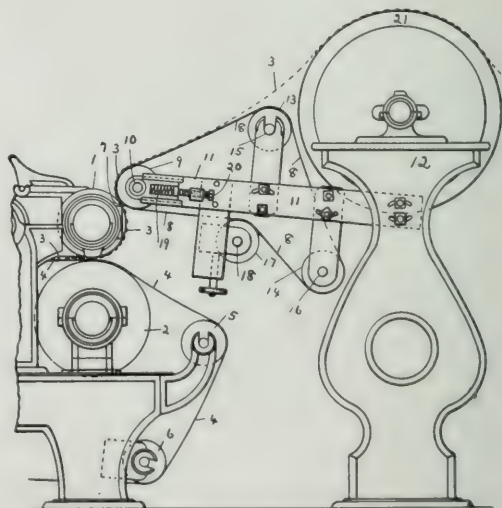
Heretofore, especially with thin paper, difficulties have arisen in successfully taking the web of paper from the last press roll to the first drier. In the ordinary paper-making machine the web of paper is passed through the last pair of press rolls on the surface of a wet carrier from which it is separated immediately after passing between the press rolls by adhering to the press roll with which it has come in contact and from which it is taken by means of its own tensile strength and led to the first drier. On account of the weakness of the web of paper at this stage of its manufacture, the web is often broken or torn by reason of its adhering at some point to the last press roll more tightly than usual. This happens especially with thin paper when a piece of pulp of greater thickness than usual or a particle of dust, dirt or other foreign substance gets into the paper and is pressed against the press roll. I overcome these difficulties and add to the efficiency of the machine by providing a movable felt pressed by a yielding tensioned roller against the web of paper upon the press roll. To this felt the paper adheres, leaving the press roll, and is carried on said felt toward the first drier and from which felt the paper is easily separated by its own strength.

The drawing is a side elevation of part of a paper-making machine embodying my invention.

1 and 2 represent the upper and lower press rolls respectively, or the last pair of press rolls if more than one pair are used, between which the web of paper 3 is carried on its progress from the paper forming end of the machine and shown by a supporting or carrying felt 4. After passing between these press rolls the carrying felt 4 is led downwardly over idler rolls 5 and 6, and then back to the paper forming end of the machine. In passing between the press rolls 1 and 2 upon the surface of the carrying felt 4, the web of paper 3 has been pressed with great pressure directly against the face of the upper press roll 1 to which the paper adheres and is carried upwardly thereon to a point 7 preferably a little above the axis of this press roll 1. At this point 7 the side of the web of paper away from the press roll 1 comes in contact with a movable felt 8 which is mounted upon and pressed against the paper by a spring pressed roll 9 journaled in bearings 10 slidably located on a frame 11 which is pivotally and adjustably supported in position as by having its other end suitably secured to the drier frame 12. This endless felt is supported on carrier rolls 13 and 14 journaled in bearings 15 and 16 respectively, provided upon the frame 11 and passes over a take-up and guide roller 17 also journaled in suitable bearings 18 upon the frame 11. In addition to the weight of the frame 11 and its supporting rolls, including tension means such as springs 19 and collecting screws 20 acting thereupon, are pro-

vided for keeping the roll 9 at all times close enough to the upper press roll 1 as to press the transfer felt 9 with sufficient pressure upon the web of paper 3 on the press roll 1 to effect the transfer of said web to the felt 8 and also to transmit motion to said felt equal to the motion of the press roll 1 and the web of paper 3 thereon. Upon coming into such pressure contact with the felt 8 at point 7 the web of paper 3 leaves the upper press roll 1 and adheres to the transfer felt 8 upon which it is carried part way toward the first drier 21 and then easily led by its own tensile strength from the transfer felt 8 to the first drier 21 over and from which it proceeds in the usual well-known course.

I find that my device overcomes the difficulties mentioned in that the web of paper is surely transferred from the last press roll to the transfer felt and from that to the first drier without being torn even though larger particles of pulp than usual or foreign matter may be present in the web of paper.



A part of the pressure for the contact of roll 9 with the paper 3 upon the roll 1 may be obtained by having the frame 11 pivotally mounted upon the drier frame 12 so that a large portion of the weight of the frame 11 and the rolls 9, 13 and 14 will be carried at the contact point of the roll 9 with the roll 1. By reason of this, weight coming upon the roll 1 at the point indicated, it exerts a very powerful pressure but one that may yield when needed. The spring 19 adds further resiliency to the pressure.

What I claim as new and desire to secure by Letters Patent is:—

1. In a paper-making machine the combination with a final press roll carrying directly on its surface a web of paper, of a movable transfer felt brought into con-

tact with said web of paper and means for so movably holding said felt in such contact.

2. In a paper-making machine the combination with a final press roll carrying directly on its surface a web of paper, of a movable transfer felt brought into contact with said web of paper and moved by such contact and means for so movably holding said felt in such contact.

3. In combination with the paper-carrying press roll of a paper-making machine, a movable transfer felt held in contact with the web of paper on said press roll of a paper-making machine, a movable transfer holding said felt in such contact.

4. In a paper-making machine a device for transferring to the first drier a web of paper carried directly on the final press roll consisting of an endless felt coming in contact with the web on said press roll and moving therefrom towards said drier, a roll directly holding said felt in contact with the web on said press roll and other supporting rolls for said felt.

5. In a paper making machine a device for transferring the web of paper from the paper-carrying press roll to the first drier consisting of an endless felt coming in contact with the paper on said press roll and moving therefrom toward said drier, a yieldingly tensioned roll directly holding said felt in contact with the paper on said press roll and other supporting rolls for said felt.

CANADIAN INVESTMENTS TOO HEAVY.

The net earnings of Union Bag & Paper for the fiscal year ended Jan. 31st, 1914, were \$534,530, as compared with \$554,251, and the balance after charges was \$50,082 as compared with \$42,993 in the previous, the amount being equal to less than 1/2 per cent. on the preferred stock in each year.

President Riegals says that while the selling prices on bags showed an improvement during the second half of the year, yet the average selling price on the bulk of the company's product was exceptionally low, due to extreme competitive condition which developed in July, 1912, and continued well into 1913.

Inventories were readjusted by charging off from surplus account \$243,423. The total bonded debt and purchase money obligations on Jan. 31st, 1914, were \$4,341,333, as compared with \$4,907,833 a year previous, making a reduction of \$566,500.

This debt was largely incurred through the purchase of Canadian properties which are very valuable and undoubtedly worth considerably more than they cost, but are not self-supporting at present.

The condition of the manufacturing plant is not all that could be desired. About half of the output is made in modern plants and the balance in antiquated plants. President Riegals estimates that \$1,000,000 could be spent on the company's mills but that one-half that sum would make a very marked improvement in the cost of operation.

The policy of the present management is first to attempt to restore the injured credit of the company, following which, unproductive properties must be made productive or sold and certain of the plants must be modernized.

The company must also strengthen itself to meet conditions arising out of the prohibition of pulpwood export from Canada and the recent tariff action of the United States Government.

The present financial condition of the company is that it has in the United States in cash assets approximately \$2,000,000, no debts to banks and its total merchandise accounts will not exceed \$75,000. In Canada it has cash assets of \$1,134,000 and unsecured bank indebtedness of \$340,000 which the holders are content to have liquidated by a gradual conversion of inventory.

BATTLE ISLAND AFFAIRS.

Special to Pulp and Paper Magazine.)

Fulton, N.Y., June 11, 1914.—The schedules of the Battle Island Paper Company on the voluntary bankruptcy proceedings have been filed at Utica by George N. Burt, attorney for the company. The schedules show total liabilities of \$1,075,564. Mr. Burt also filed an answer for the Hunter Arms company to the creditors' petition in bankruptcy in which he denies that Post & Piloto are creditors of the Hunter Arms company. He also denies that the company has committed the acts of bankruptcy alleged. This answer holds up proceedings under the involuntary petition. It does not affect the receivership, but does prevent adjudication.

Of the \$1,075,564 liabilities of the Battle Island Paper Company, \$610,550 are claims of secured creditors holding first mortgage bonds of the company, which cover all the company's real estate.

To unsecured creditors the company owes \$429,813. Of this \$35,178 is in notes made by other concerns and discounted by the Battle Island Company at Fulton and Oswego banks.

The assets are placed at \$2,941,425. The real estate is valued at \$937,000, and debts due to the company are placed at \$8,047.

Included in the assets is also a claim against the State for property taken at Fulton for barge canal purposes. This claim is placed at \$1,800,000. It has not yet been adjudicated.

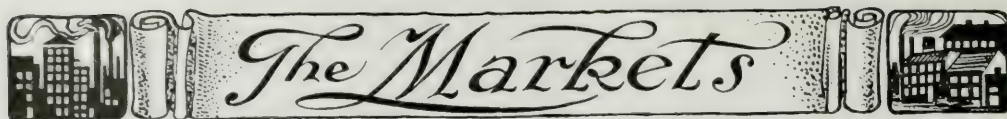
The schedules were authorized by the board of directors and signed by F. B. Shepherd as treasurer.

FIRST CAR OF PAPER SHIPPED MAY 27TH

Special to Pulp and Paper Magazine.)

Fort Frances, Ont., June 4th. W. F. Brooks, of Minneapolis, vice-president of the Ontario and Minnesota Power Company and the Fort Frances Pulp and Paper Co., also of the Minnesota and Ontario Power Co., and International Lumber Co., of Fort Frances and International Falls, was a visitor in town yesterday. Mr. Brooks said that it was a pleasure to him to see the new paper mill turning out paper and hoped that it would be a benefit to Fort Frances and assist in its growth and progress. Mr. Young said the first shipment of paper from the Fort Frances mill was made on May 27th to the Winnipeg Telegram. In future, said Mr. Young, both the Winnipeg Telegram and Tribune will receive their paper from Fort Frances. The mill is now running nicely and smoothly under the supervision of Supt. Ross, and it is hoped that ere long all the daily papers west of the Great Lakes will be using Fort Frances paper.

The next issue of the Pulp and Paper Magazine will contain accounts of the development of building operations in one or two of the leading mills in the country.



The Markets

CANADIAN MARKETS

The general conditions continue fair and news print keeps up well in price and demand. Instead of the market being overdone by recent increased tonnage, there seems to be a ready sale for all that is presented to the trade. In fact, one Canadian plant is so busy with orders for news print that it has withdrawn all quotations. Book and writing mills appear to be fairly well employed and the whole outlook for summer trade is more encouraging than it was some time ago; the production will not be anything like last season. Orders are much smaller and in weight and finish differ very widely. Wrapping paper mills are quiet. Business in this line and in glazed and unglazed krafts is badly cut in the matter of prices. Ground wood and chemical pulp mills are moderately active, but are anticipating much better business in the next few weeks owing to the low water on the other side of the line. Water conditions in Canada are not very encouraging and all the streams are low, but the state of affairs is much better than across the border. The rag and paper stock market is dull and no immediate improvement is looked for.

Following are the quotations f.o.b. Toronto:

Paper.

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.05 to \$2.20 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.50, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila, B., \$2.50 to \$3.00.
 Manila, No. 2, \$2.85 to \$3.50.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$3.75 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$16.
 Ground Wood, \$21 to \$24, delivered in United States.
 Sulphite (unbleached), \$41 to \$43, delivered in Canada.
 Sulphite (unbleached), \$42 to \$44, delivered in United States.
 Sulphite (unbleached), \$55 to \$58, delivered in Canada.
 Sulphite (bleached), \$56 to \$58, delivered in United States.

Paper Stock.

No. 1 faced shavings, \$1.87½ to \$1.90, f.o.b. Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 sorted shavings, 4c.
 Waste fibrous, \$7½c. to 90c.
 House cleaning stuff, \$1.40 to \$1.45.
 Grindings, edge stock, \$1.10.
 No. 2 bond stock, 4c. to 60c.

No. 1 book stock, 70c.
 No. 1 Manila envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 25c to 27½c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.30 to \$1.32½.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinettes, 80c.
 Flock, 85c.
 Tailor Rags, 70c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

FELT MILL BURNED.

The plant of the Lachute Knitting Mills, Lachute, Que., manufacturers of felt, was burned to the ground on Friday, June 5th, entailing a loss of \$40,000.

NEW YORK MARKETS.

Office, Pulp and Paper Magazine,
206 Broadway, New York.

June 13th, 1914.

The situation in ground wood has materially strengthened during the interval. An early dry season brought about a shortage of water at certain paper mills which had to come into the market for ground wood pulp. These mills paid an average price of more than \$16 at the mill. The lowest price paid for fresh pulp was a contract order for 3,000 tons at \$15.88 at the mill. No. 2 pulp, which consists of storage piles that have been standing anywhere from two months to more than two years, has brought an exceptionally good price, the lowest being \$15.08 at the mill. Local grinders are very confident of the future and regard this year very favorably. The heavy consumption of ground wood has been largely attributed to the good demand for news print.

The chemical fibre markets are essentially unchanged except that certain paper mills are forcing the price in spot orders down. Certain importers who bought on speculation have had some cause to regret it as they have lost money on their deals. Some shipments of unbleached sulphite have been made at \$1.94 delivered with a 16-cent freight rate. No contracts have been made as yet.

Bags and bagging are in poor demand and prices are weak. Shippers have been holding roofing stock in preference to making deliveries until satisfactory arrangements have been made with paper manufacturers.

The old waste paper market has been somewhat quiet owing to the easing in the demand for book papers and boxboards. Soft white showings are commanding 1.80c to 1.90c, and the higher grades of hard shavings are quoted at 2.35c to 2.45c. Flat stock is in fair demand and its grades are quoted as follows:—Heavy stitchless, 95c to 1.05c; magazine 90c to 95c; crumpled 75c to 80c. Box board chips are now ranging from 35c to 40c, although mills are offering as low as 32½c. The condition of old newspapers is essentially unchanged. Old mixed papers are in rather poor demand, and the price of 27½c to 32½c is rather weak. Common paper has been sold in the local market as low as 20c, although the market value seems to be about 22½c to 27½c a hundred pounds.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.
Ground Wood, No. 2, \$15 to \$17, delivered.
Unbleached sulphite, dom., 1.90c to 2.20c, delivered.
Unbleached sulphite, imptd., 1.85c to 2c., ex. dock.
New York.
Bleached sulphite, domestic, 2.80c. to 3c., delivered.
Bleached sulphite, imptd., 2.60c. to 2.90c. ex. dock.
New York.
Easy Bleaching, imptd., 2c to 2.15c ex. dock. New York.
Unbleached sulphate, imptd., 1.75c to 2c., ex. dock.
New York.
Bleached sulphate, imptd., 2.50c to 2.75c., ex. dock.
New York.
Kraft Pulp, 1.75c to 1.85c, ex. dock, New York.

The improved condition of the financial market of New York has restored considerable confidence in business interests, and the result has been a somewhat healthier tone to business in general. There has been

a good deal of pessimistic talk regarding the acts of the government in its treatment of the large corporations and also a good deal of talk attributes the business depression to the tariff and the Mexican situation. Local factors who have travelled considerably both in this country and Europe report that the condition is not local, but international. It is the opinion of one factor that the trouble is not with the administration, in which he has great confidence, but rather to the waste and expense caused by the Balkan war, which has kept investors from placing their money in new projects. The lack of development in South America is due to a need of capital, which cannot be obtained on account of the tying up of large sums in the financing of that disastrous war. As the usual quiet season is now on for the paper business, there is little demand and the market reflects a quiet tone. The heavy consumption of newsprint shows little easing although most of it is not due to heavy advertising, but to the imprinting and heavy editions. The prevailing opinion is that newsprint will advance in price before the end of the summer. Reports from all over the country show that stocks are very low among jobbers, and consumers of all grades of paper. Book is in poor demand as this is the quietest time of the year for this grade. Prices are firm, however. Wrappings and manilla papers are in quiet demand and values are inclined to be weak. The value of boards is rather on the decline under slight consumption and poor demand. The specialty business still maintains a good demand and fair values. Paper towels and toilet papers are in good demand at firm prices. The tissue market is weak and quiet, and it is reported that some mills have shut down. Paper bags are in poor demand but values are firm. The best demand for writings is in the cheaper grades.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
News, side runs, \$2 to \$2.10 f.o.b. mill.
News, sheet, \$2.25 to \$2.30 f.o.b. mill.
Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
Writing paper, superfine, 13½c to 17c., del. east of Miss. River.
Writing paper, extra fine, 11c., del. east of the Miss. River.
Writing paper No. 1, fine, 9c., del. east of the Miss. River.
Writing paper, No. 2, fine, 8c., del. east of the Miss. River.
Writing paper, engine sized, 4½c. to 8c., del. east of the Miss. River.
Bond paper, 5c. to 24c., delivered east of Mississippi River.
Ledger paper, 8c. to 30c., delivered east of Mississippi.
Linen paper, 7c. to 18c., delivered east of Mississippi River.
Manila jute, 4¼c. to 5½c., delivered.
Manila, wood, \$2.40 to \$3.00, delivered.
Kraft, No. 1, \$3.50 to \$3.75 f.o.b. mill.
Kraft, No. 2, \$3.25 to \$3.50, f.o.b. mill.
Boxboards, news, \$28 to \$30 per ton, delivered.
Boxboards, chip, \$26 to \$28 per ton, delivered.
Boxboards, straw, \$27 to \$29 per ton, delivered.
Wood pulp board, \$42.50 to \$45 per ton, delivered.
Tissue, white, cylinder, 40c. to 42½c., delivered.
Tissue, fourdrinrie, 47½c. to 50c., delivered.
Tissue, jute Manila, 40c. to 41½c., delivered.

THE BRITISH MARKETS.

Special to Pulp and Paper Magazine.

London, June 3, 1914.

There is very little improvement to report in the state of the British paper industry. Since the beginning of the year business has been in a dull state, but manufacturers continue to be optimistic, while the paper agents are complaining bitterly over the small profits they are turning over compared with this time last year. On export account particularly is the dullness of trade felt in all qualities of papers and boards, but in the home trade there are just sufficient orders on hand to keep mills running at a steady capacity and no more. There is a fair demand for fine printing papers and good grades of news print, but packing and wrapping papers are dull and only the cheap foreign products from Sweden and Germany and Norway are finding any sort of an outlet in the market. Envelope papers are in demand. Paper hangings are slow in moving, both in the domestic and foreign markets, which appears somewhat singular, as at this period of the year there is usually plenty of orders on mill books. British manufacturers are not bashful now in stating that trade recently has been greatly against them and in some mills short time has been resorted to. Reports from the continent also show that the paper industry is passing through a dull period and that makers of all classes of papers could do with a larger number of orders than they are experiencing at present. In Scandinavia there is a good deal of uneasiness over slowness of new business.

Large consignments of mechanical pulp are now reaching England under contracts, and enquiries have recently been numerous regarding new contracts, the dullness of the paper trade no doubt being taken advantage of with a view to knocking down current quotations. At present mechanical is somewhat quiet and prices are unchanged. Contracts extending over three and four years have been entered into. This is one of the great tendencies now in England and efforts have recently been made to make the periods of contracts extend up to five years, a fact which Canadians might not lose sight of. The prices of these contracts are stated to be satisfactory from the producer's point of view. Prices are now about as follows, c.i.f. British ports:

Pine, 50 per cent., unwrapped, prompt, \$9.60 to \$10.

Pine, dry (prompt), \$20 to \$23.

For forward delivery charge about half a dollar extra.

The enquiries for sulphite and sulphate are numerous, but not much business is passing notwithstanding signs of weakness in prices. Strong sulphite has recovered itself slightly, but easy bleaching sulphite is inclined to continue weak. There is no activity in news paper, but there is a slight improvement in easy wrapping. Reports from Scandinavia show that mills have still full stocks on hand and complaints are frequent about the dearth of new business being transacted. Prices are about as follows, c.i.f. British ports:

Bleached Sulphate (No. 1), \$35.80 to \$60.

Easy bleaching sulphite, \$41.40 to \$45.

Sulphite news, \$36.60 to \$41.10.

Unbleached soda, \$36.50 to \$36.70.

Soda lumps, \$41.80 to \$46.

Trade in rags is good and prices are unchanged, and are likely to continue so for some time. Esparto is steady, but, of course, considerably dearer than it was this time last year; neither do the arrivals of supplies since January come up to those of last year. Shippers are, therefore, not pressing for offers. Rosin is quiet for sometime past and sizing shows signs of hardening in prices.

The chemical markets in Liverpool, Manchester and London are extremely quiet, but prices show no change. Bleaching powder is quoted at \$24.50; caustic soda \$48 for 70-76 per cent.; salt cake \$9.60; and soda crystals \$9.80. The demand for china clay has somewhat fallen and there is talk of prices also coming very slightly. However, an increased demand would at once harden prices again.

REASONS FOR FREIGHT RATE DECISIONS.

(Special to Pulp and Paper Magazine.)

Dayton, O., June 10, 1914.—Local news consumers were interested in the announcement the past week of the Interstate Commerce Commission of the reduction of rates on news print paper from Sault Ste. Marie, Canada, to Dayton, Cincinnati, and other Ohio points, also to points in adjoining states. According to the plan, the rates from the Soo to points in Ohio must be placed on a parity with existing rates from the group of Fox River mills in Wisconsin to the same destination of 1.7 cents a hundred.

The Commission appears to have found that the average distance from the mills in the Fox River group to Ohio destinations was 11 miles greater than from the Soo, but that the average rate was 1.7 cents less. On account of this the commission held that a reduction to the basis of the Fox River rates would be reasonable.

The present rate from the Soo to the Ohio destinations is 17.7 cents. No reparation to Ohio buyers is ordered, although the Commission held that reparation should be granted on shipments between the Soo and Chicago.

The points in Ohio to which the reduction is made are Dayton, Cincinnati, Portsmouth, Marietta, Youngstown, Cleveland, Toledo, Akron, Springfield, Columbus, and Canton. The reduction also extends to Pittsburg, Pa.

The decision was rendered in the case of the Lake Superior Paper Company against the Duluth, South Shore and Atlantic Railroad and others. The Lake Superior Company has a large pulp and paper mill at Sault Ste. Marie, Ont., with general offices in this city. H. E. Talbot, of this city, is the president of the company and George Mead, of Chillicothe and Dayton, is also a prominent officer. All local interests appeared to have been pleased with the decision. The News League of Ohio, with publications in this city and Springfield, are heavy consumers of Soo news print, and the decision was of direct interest to many daily newspapers and weeklies in the state.

ABITIBI'S PROGRESS.

President Anson of the Abitibi Power and Paper Company, is a busy man these days. The new ground wood plant at Froquois Falls will be in operation on June 15th. The company has been advertising for grinder men, wet machine men and barker men and have received many applications from all over Canada. Ultimately the plant will have a capacity of 225 tons daily.

PULP AND PAPER NEWS

The pulp and paper mills in Queens County, Nova Scotia, owned by Frank Stanfield, have just been sold to a syndicate.

The Shawinigan Water & Power Company, Power Building, Craig Street, Montreal, P.Q., are contemplating the purchase of 800 thirty-foot cedar poles, to be delivered within the next three months.

The Dunlop Pulp & Paper Mills, Limited, has been incorporated with head office at Selkirk, Man., and capital of \$1,000,000. Among those interested are F. A. Dunlop, 316½ Donald Street, and T. McHattie, 846 Main Street. The company is given power to buy, sell and manufacture pulp and paper.

Mr. Duncan Chisholm, representing the Chisholm Corporations, Limited, has entered into an agreement with the Ontario Government for the purchase of the pulp wood on the Metagami River pulp limit. Tenders for this limit were received until December 31st last, but none of the offers were acted upon at the time because certain conditions were not considered satisfactory to the government. One of the conditions of the tender is that the company shall instal a pulp mill costing not less than \$250,000 to handle seventy-five tons of pulp per day and employ not less than 200

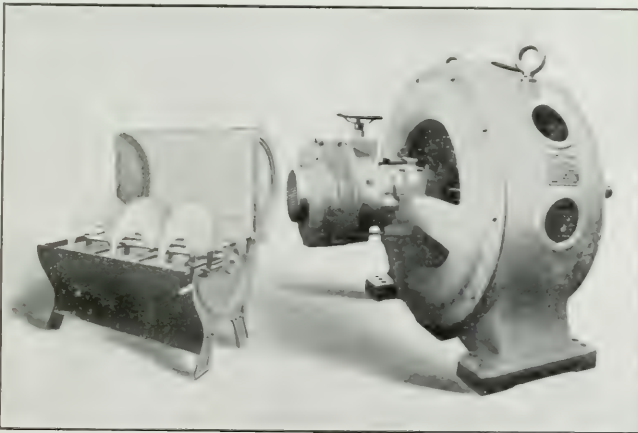
hands on an average of ten months in the year. Crown timber dues of 40 cents per cord for spruce and 20 cents per cord for other woods are to be imposed, the Crown reserving a railway right-of-way, water powers, and granted lands.

Mr. Justice Morrison of the Supreme Court of British Columbia has confirmed the contract between the Western Canada Trust Company as receivers for the debentures-holders of the Ocean Falls Company and Messrs. Fleishhacker Bros. and Johnston, of San Francisco, by which the large plant of the Ocean Falls Company, situated 200 miles north of Vancouver is to pass under the control of a merger of the Pacific Coast Pulp and Paper interests. The contract is reported to have been endorsed by the debenture-holders at a recent meeting in London, England. The plant is one of the largest on the coast and is equipped with modern machinery for producing 140 tons of dry pulp per day. The sawmill in connection with the plant has been in active operation for some time. It is expected that the pulp plant will be again in operation in the near future. The Fleishhacker interests already control a large pulp mill on Quatsino Sound and another on Howe Sound, together with other pulp mills at various points on Puget Sound.

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CORRECTION IN ARTICLE ON MANUFACTURE OF SULPHITE WOOD PULP (June 1st Issue.)

Page 263, under "Preparation of acid," on line 3
Reads: $(Ca Mg) H_2SO_4 \rightarrow 2 H_2SO_4 +$

nH_2O .

Should be: $[(Ca Mg) (H_2SO_4)_2 + 2 H_2SO_4 +$
 nH_2O .

$12 H_2SO_4 \rightarrow 2$ or more molecules of H_2O_2 and
 $nH_2O =$ indefinite number of molecules of H_2O .)

Page 294, Col. 2, Line 16 from the bottom

Reads: "To every 6 lbs of this burnt of metal"

Should be: "To every 60 lbs of this burnt metal"

TIMBER LIMITS IMPERILED.

Blind River, Ont., June 2. For the past ten days there has been great anxiety felt by the residents of Blind River as to the outcome of the forest fires which have been general in this district. The government had placed again for sale the limits withdrawn by them last March. As the greater part of the timber on these limits consists of trees blown down in the great storm of November 2nd last, the fear of the fire destroying trees would seriously impair the activity of business prospects in the Blind River district, and interfere with the forthcoming government sale on July 6th next. The rainfall therefore was welcomed greatly.

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MORRIS

CHAIN

BLOCKS

THE MEN LIKE THEM.

THE HERBERT MORRIS CRANE

& HOIST COMPANY, Limited

EMPRESS WORKS, Peter Street, TORONTO.

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent

PUBLIC NOTICE is hereby given that on **WEDNESDAY, August 5th, 1914, at 10 o'clock A.M.**, the Timber Limits hereinafter mentioned will be offered for sale by Auction without reserve, at the office of Messrs. Lefebvre & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec.

License No.	Sq. Miles
181 River St. Jean Br. East No. 1	22
182 River St. Jean N.E. Branch No. 2	18
183 River St. Jean East Branch No. 3	20
184 River St. Jean, No. 2	12
185 River St. Jean, No. 3	12
186 River Salmon & Tahiti River St. Jean	24
187 River Magpie, No. 4	32
188 River Magpie, No. 5	32
189 River Magpie, No. 6	32
190 River Magpie, No. 7	32
191 River Magpie, No. 8	32
192 River St. Jean, No. 1	24
193 River St. Jean, No. 2	24
194 River St. Jean, No. 3	24
195 River St. Jean, No. 4	18
196 River St. Jean, No. 5	20
197 River St. Jean, No. 6	20
198 River Magpie, No. 1	32
199 River Chambers, No. 1	36

A total of 377 square miles more or less. Also a certain area of freehold land to be used as a mill site and fully described in deeds in the hands of the undersigned creditors.

Conditions of Sale: Two per centum cash on adjudication, the balance payable upon transfer of the licenses, which transfer fees will have to be made at once, the transfer fee to be payable by the purchaser.

The purchaser will pay in addition to the purchase price, the notary fees of one per centum and will accept the licenses as they are delivered and unconditionally on the part of the estate as to the correctness of the area of the land.

For a copy of the licenses and other particulars please apply to the undersigned.

A. E. C. ROSS (Messrs. P. S. Ross & Sons),
141 Notre Dame St. West, Montreal
LEGAT: TRUDEL, Messrs. Lefebvre & Trudel,
126 St. Peter St., Quebec

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

Published by The Industrial and Educational Press, Limited

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A. G. McIntyre, B.A., B.Sc., Contributing Editor

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VOL. XII.

MONTREAL, JULY 1, 1914

No. 13

Pulp Wood Consumption

The growth of Canada's pulp industry is strikingly shown in the bulletin of Pulp Wood Consumption issued by the Forestry Branch of the Department of Interior, appearing in this issue of the Pulp and Paper Magazine.

The greatest care has been taken by the Government officials to make the study complete and accurate, and year by year greater reliance can be placed in the figures as approximating very closely the actual conditions. Of course, it is always difficult to secure the most complete data owing to the failure of some mills to send in reports, but that the present compilation covers practically the whole field should be a reason for congratulations to the firms who co-operated in securing these statistics.

There is really just one main conclusion to be drawn from this bulletin, and that is that Canada's pulp industry is growing, and growing very fast. The fact that practically 30 per cent more pulp wood was consumed in mills in 1913 than in 1912 and that in 1913 51.7 per cent of the pulp wood consumed as against 46.9 per cent in 1912 was manufactured into paper in Canadian mills, together with the fact that the sulphite process held its own with one-third of the total consumption of wood and kraft paper increased by over 6 per cent indicate that the industry is making great strides, and that the higher grades of paper are to be largely manufactured.

The increase in price of 51 cents a cord at the mill for raw material is rather disconcerting. This is indicative of a difficulty of obtaining supplies which sooner or later will develop into the state of affairs

which is all too rapidly coming into being in the United States and the Scandinavian countries. Happily, however, Canada, still has sufficient raw material to be able to export irrespective of regulations which should cause the material to be manufactured in the Dominion. This would indicate that we have not yet reached by any means that crisis in which we shall be forced to adopt some means to secure raw material as have these other countries. It is to be hoped that the increase in mills and production of pulp will be maintained and that the economic balance will be reached in which Canada can manufacture all her growth of pulp wood at a profit.

Parliament and Business

Pulp and paper manufacturers have not had any great issues connected with the Federal House during the past session. A few minor changes in departmental regulations and some Orders-in-Council of moderate scope have come into the horizon, but the main interest has centred in the way in which Parliament's costs affect general financial conditions. The principal issue was, of course, the railway problem.

For the Welland ship canal, for the Quebec Bridge, the National Transcontinental, the Intercolonial and the Hudson Bay Railway, the total appropriations made by Parliament this year have amounted to about twenty-six million dollars. If the aid granted to the Canadian Northern System is also taken into account it will be seen that in cash or credit Parliament has voted over seventy million dollars for State or quasi-State owned railways and canals.

The total appropriation of Parliament for the expenses of administration, and for the great national work, amounts to the record total of \$208,000,000. Of this total approximately fifty-one million dollars is in capital account. One new federal railway undertaking was provided for by a vote of one million dollars to undertake surveys and possibly also construction this year, for the government line approximately 300 miles in length, joining Montreal with the Transcontinental railway.

The Government has also provided in the estimates for important improvements to the Intercolonial Railway and for the construction of branch lines in Nova Scotia a further large amount is provided.

The total expenditure for the year promises to be about \$190,000,000, with revenue, according to present indications about fifteen millions less than last year, or approximately \$150,000,000. The Government however, feels that liberal expenditures are justified under the existing circumstances, and will materially assist in lifting the country over the present period of financial depression. Both the Canadian Northern Railway and the Grand Trunk Pacific Company have received bond guarantees which will enable them to prosecute the completion of their respective transcontinentals without serious interruption.

The indorsing of the bonds has eased the business situation for the present. Already a large order for steel rails has been placed with the rolling mills, and this money will find its way into every industry in the country.

According to the report made by the Minister of Trade and Commerce, Canadian industries are doing well. In his bulletin Sir George Foster shows that in 1914 there was an increase of exports of 57 per cent over 1911. A comparison with last year's trade reports shows a gain of \$75,833,839 in exports of Canadian produce the totals being: 1913 \$355,754,600; 1914, \$431,588,439.

Loans which have been made on mortgage are being well met, according to the mortgage and trust companies, and arrears are in as good shape as at any period during the last five years.

The crop reports are by far the most encouraging which the country has had for years. In the United States there are fully four million acres, and in Canada two million acres more land under cultivation than last year. The harvest will be advanced at least a week, giving greater assurance than ever of plenty of money.

The legislative activity which comes closest to the interest of the pulp and paper industry was the vote of the Senate to amend a bill dealing with matters in the Post Office Department, which contained among other clauses, one which would take out of the hands of Parliament and place in the hands of the Postmaster-General, subject to the approval of the Treasury Board, the power of changing newspaper postage

rates. There was no reason for supposing that the present Postmaster-General would be more disposed than any other Postmaster-General to make exorbitant charges to the Press. But there was a wide-spreading feeling, voiced strongly by the representatives of the Canadian Press Association, that the power was capable of being abused, and that there was no good reason why, in this case, Parliament should surrender its power to any Minister. In an effort to reach a compromise the Postmaster-General agreed to fix a maximum charge beyond which he could not go, and to make rates, when fixed, subject to the approval of the Treasury Board, who were to hear the representations of any parties who might be dissatisfied with the Minister's decision. In this shape the bill came back to the Senate, but was finally thrown out. The universal satisfaction of newspaper men at the action of the Senate, will be shared by the pulp and paper industry.

The Parcel Post

The Parcel Post means an increased use of every form of paper. Mail Order houses print catalogues on coated and fancy papers, the letters of inquiry and reply are written on bond and other papers. Goods are packed in board and corrugated paper, and contained in wrapping and kraft and bound with paper tape and twine. The mail order business of the United States has gone ahead by leaps and bounds with the extensions of the functions of the Post Office and the same will be true in Canada when the parcel post system comes fully into operation.

To the parcel post idea has been added another by the Adams Express Company in the United States. It appears that a serious drawback in the operation of the Parcel Post has been that while the consumer had to deal directly with the producer, neither party has the opportunity as a rule of satisfying itself as to the responsibility of the other. Into this breach the Express Company now steps. It will become, "a clearing-house for excess production, disposing of fruits, berries, butter, eggs poultry, fish, meats and other food articles at a minimum of expense to seller and buyer. The company is responsible to both delivering the commodities to the buyer's door and the money to the seller, without any intervening agency. The rate on the class of merchandise for which the bureau is designed is 25 per cent below the commercial rate fixed by the Interstate Commerce Commission, and is no higher than parcel-post charges. To the cost of carrying must be added the money-order charge, ranging from 3 cents for \$2.50 to 15 cents for \$40."

The company plans such prompt delivery of perishable goods that they will be in the hands of the consumer on the same day that they are shipped from points 200 miles distant, and there is a possibility that the system will be extended to include goods of all kinds.

PULPWOOD CONSUMPTION, 1913

STATISTICS COMPILED BY THE FORESTRY BRANCH, DEPARTMENT OF THE INTERIOR,
OTTAWA.

This bulletin is based on reports received from 48 firms operating pulp mills in Canada in 1913. Altogether 65 mills are operated by these firms as follows: Quebec, 26 firms operating 34 mills; Ontario, 12 firms operating 17 mills; Nova Scotia, 4 firms operating 6 mills; New Brunswick, 4 firms operating 3 mills, and British Columbia 2 firms operating 3 mills.

In addition to these active firms, reports were received from 10 firms whose mills were idle in 1913, and from 5 firms with mills under construction.

The 48 active firms reporting in 1913 consumed in their mills a total of 1,109,034 cords pulpwood valued

at the mill at \$7,243,368. A total of 1,035,030 cords of unmanufactured pulpwood valued at \$7,070,571 was exported from Canada to the United States during the same year, bringing the total production of pulpwood to 2,144,064 cords valued at \$14,313,939.

Pulpwood.

Table 1 shows the quantity, total value and average value per cord of the pulpwood used in each of the provinces of Canada in 1912 and 1913, and the number of active firms reporting in each case.

TABLE I.

Pulpwood, 1912 and 1913, by Provinces, Quantity Cut and Total Value, 1913. Average Value 1912 and 1913, and Per Cent Distribution, 1913.

PROVINCES	No. of Active Firms Reporting 1913	QUANTITY		Per Cent Distribution	Total Value	Average Value Cord	
		1912 Cords	1913 Cords	1913	1913	1912	1913
CANADA	48	866,042	1,109,034	100.0	\$	\$ c.	\$ c.
Quebec	26	578,855	629,934	56.8	7,243,368	6.02	6.53
Ontario	12	173,903	321,244	29.0	4,107,689	5.85	6.52
British Columbia	2	35,067	81,173	7.6	2,297,389	7.10	7.15
New Brunswick	4	52,041	58,121	4.8	404,218	5.51	4.77
Nova Scotia	4	26,176	20,562	1.8	342,243	5.52	6.44
					94,829	4.32	4.61

The quantity of pulpwood consumed in Canadian pulp mills in 1913 was an increase of 28.1 per cent. over that of 1912. The average price of raw pulpwood at the mill increased by 51 cents a cord, making an increase of 38.9 per cent. in the total value of the raw material used in this industry.

Quebec and Ontario still led the other provinces in 1913, as in 1912. British Columbia displaced Nova Scotia from fourth place on the list in 1912 and displaced New Brunswick from third place in 1913. This province now consumes 7.6 per cent. of the pulpwood used in Canada and will probably increase this proportion in the future as the pulp industry on the Pacific Coast is still in its infancy. There was an in-

crease in consumption in every province but Nova Scotia where the closing of four mills resulted in a decrease of 21.4 per cent. The increases were: Quebec, 8.8 per cent.; Ontario, 84.7 per cent.; British Columbia, 140.0 per cent.; New Brunswick, 2.1 per cent.

The average cost of pulpwood at the mill in Canada in 1913 was \$6.53, an increase of 8.5 per cent. from 1912. The cost increased in Quebec, Ontario, New Brunswick and Nova Scotia, and decreased in British Columbia.

Table 2 shows the quantity, value and per cent. distribution of the kinds of wood used in making pulp in Canada in 1913.

TABLE II.

Pulpwood, 1912 and 1913, by Kinds of Wood.—Quantity Cut and Total Value, 1913. Average. Value 1912 and 1913, and Per Cent Distribution, 1913.

KINDS OF WOOD	QUANTITY		Per Cent Distribution	Total Value	Average Value Cord	
	1912 Cords	1913 Cords	1913	1913	1912	1913
TOTAL	866,042	1,109,034	100.0	\$	\$ c.	\$ c.
Spruce	677,747	754,858	68.1	5,104,221	6.09	6.76
Balsam Fir	164,587	283,292	25.5	1,806,911	5.81	6.38
Hemlock	19,178	47,360	4.3	201,480	5.53	4.25
Jack Pine	40	19,383	1.7	101,675	4.00	5.25
Poplar	4,405	4,141	0.4	29,081	6.21	7.02

Only five kinds of wood were used in the manufacture of pulp in 1913. Spruce headed the list with over two-thirds of the total. The percentage of balsam fir used in pulp making has increased steadily as the prejudices against this wood have been overcome. In 1911 balsam formed 17.5 per cent. of the total; in 1912, 19.0 per cent.; and in 1913, 25.5 per cent. The wood has been found to make excellent pulp, equal in

many cases to that made from spruce alone, but a prejudice existed against its use. Fir generally gives a 10 per cent. lower yield of pulp than spruce and is therefore not so desirable from the mill operator's standpoint.

Table 3 shows the extent to which the five different kinds of wood were used in each province in 1913 in the different processes of pulp manufacture.

TABLE III.

Pulpwood, 1913, by Provinces, Kinds of Wood and Processes: Quantity of Wood Used.

Provinces	Total	Spruce	Balsam Fir	Hemlock	Jack Pine	Poplar
TOTAL—ALL PROCESSES						
Canada	Cords 1,109,034	Cords 754,858	Cords 283,292	Cords 17,360	Cords 19,383	Cords 4,141
Quebec.....	629,934	389,523	222,738	705	13,327	3,641
Ontario	321,244	259,999	54,165	524	6,056	500
British Columbia	81,173	39,742		11,131		
New Brunswick	53,121	18,037	5,084			
Nova Scotia	20,562	17,557	1,305	1,700		
MECHANICAL PROCESS.						
Canada	600,216	398,429	182,413	18,894		500
Quebec	398,664	243,480	155,184			
Ontario	135,753	111,413	23,840			500
British Columbia	38,535	21,341		17,194		
Nova Scotia	20,562	17,557	1,305	1,700		
New Brunswick	6,702	4,618	2,084			
SULPHITE PROCESS.						
Canada	367,105	263,228	74,116	27,761		2,000
Quebec	105,650	62,859	40,791			2,000
Ontario	175,398	144,549	30,325	524		
British Columbia	45,638	18,401		27,237		
New Brunswick	40,419	37,419	3,000			
SULPHATE PROCESS.						
Canada	136,569	90,423	26,763		19,383	
Quebec	120,476	80,386	26,763		13,327	
Ontario	19,093	4,037			6,056	
New Brunswick	6,000	6,000				
SODA PROCESS.						
Canada	5,144	2,798		705		1,641
Quebec	5,144	2,798		705		1,641

The manufacture of ground wood pulp still consumed over half (54.1 per cent.) of the wood used for pulp making in Canada. This percentage has been decreasing in the last few years. The sulphite process, the most important of the chemical processes, was used in manufacturing a third of the total quantity of wood into pulp in 1913. This proportion is practically the same as in 1912.

The increased manufacture of Kraft papers has

caused an increased demand for pulp made by the sulphate process. This process was used with 12.3 per cent. of the pulpwood in 1913, as compared to 7.7 per cent. in 1912. The manufacture of soda pulp has greatly decreased, only 5,144 cords of wood being used for this process.

Table 4 gives a summary of the information contained in the first three tables with some additional details.

TABLE IV.

PULPWOOD, 1913, BY PROVINCES, KINDS OF WOOD AND PROCESSES: Number of Active Firms Reporting, Quantity of Pulpwood Used, Quantity of Pulp Produced, Quantity of Each Kind of Wood Used in Each Process, Total Cost and Average Cost per Cord.

	Total	Quebec	Ontario	British Columbia	New Brunswick	Nova Scotia
Number of Active Firms Reporting...	48	26	12	2	1	1
Pulp Produced:						
Aggregate.....Tons	854,624	514,299	228,498	61,354	29,911	20,562
Mechanical....."	600,216	398,664	135,753	38,535	6,702	20,562
Sulphite....."	183,552	52,825	87,699	22,819	20,209	
Sulphate....."	68,284	60,238	5,046		3,000	
Soda....."	2,572	2,572				
Wood Used:						
Aggregate.....Cords	1,109,034	629,934	321,244	84,173	53,121	20,562
Aggregate Cost	\$7,243,368	\$4,107,689	\$2,297,389	\$401,218	\$342,243	\$94,829
Average Cost.....	\$6 53	\$6 52	\$7 15	\$4 77	\$6 44	\$4 61
Spruce:						
Total.....Cords	754,858	389,523	259,099	39,742	18,037	17,557
Total Cost	\$5,104,221	\$2,623,437	\$1,871,023	\$214,607	\$312,735	\$82,419
Average Cost	\$6 76	\$6 73	\$7 20	\$5 40	\$6 51	\$4 69
Mechanical....Cords	398,409	243,480	111,413	21,341	1,618	17,557
Sulphite....."	263,228	62,859	144,519	18,101	37,419	
Sulphate....."	90,423	80,386	1,037		6,000	
Soda....."	2,798	2,798				
Balsam Fir:						
Total.....Cords	283,292	222,738	54,165		5,084	1,305
Total Cost	\$1,806,911	\$1,374,315	\$397,478		\$29,508	\$5,610
Average Cost	\$6 38	\$6 17	\$7 34		\$5 80	\$4 30
Mechanical....Cords	182,413	155,184	23,840		2,084	1,305
Sulphite....."	74,115	40,791	30,325		3,000	
Sulphate....."	26,763	26,763				
Hemlock:						
Total.....Cords	17,360	705	524	44,131		1,700
Total Cost	\$201,480	\$3,877	\$4,192	\$186,611		\$6,800
Average Cost	\$4 25	\$5 50	\$8 00	\$4 20		\$4 00
Mechanical....Cords	18,894			17,191		1,700
Sulphite....."	27,761		524	27,237		
Soda....."	705	705				
Jack Pine:						
Total.....Cords	19,383	13,327	6,056			
Total Cost	\$101,675	\$80,479	\$21,196			
Average Cost	\$5 25	\$6 01	\$3 50			
Sulphate.....Cords	19,383	13,327	6,056			
Poplar:						
Total.....Cords	1,141	3,641	500			
Total Cost	\$29,081	\$25,581	\$3,500			
Average Cost	\$7 02	\$7 03	\$7 00			
Mechanical....Cords	500		500			
Sulphite....."	2,000	2,000				
Soda....."	1,641	1,641				

The 48 active firms reporting pulp manufacture in 1913 operate altogether 65 different pulp mills. These firms each used on an average 23,105 cords of wood as compared to 18,042 in 1912. Each one of the individual 65 mills consumed an average of 17,062 cords of pulpwood. The largest individual mills are situated in British Columbia where the average mill consumption was 28,058 cords. Quebec has the greatest number of mills, and the average consumption of these was 18,527 cords. The average mill consumption in the other provinces was as follows: Ontario, 18,897 cords; New Brunswick, 13,280 cords; and Nova Scotia, 5,140 cords.

The figures given in Table 4 for pulp produced are estimated from the quantities of pulpwood consumed and the method of manufacture. One cord of wood is

assumed to produce one ton of ground wood pulp or one-half ton of chemical fibre, air dry.

Air dry pulp is assumed to contain 10 per cent of moisture and 90 per cent bone dry fibre.

So many conditions affect the average price of pulpwood that the figures given above cannot be taken too literally. Some mills purchase pulpwood on the open market and pay high prices for it plus the cost of transportation. Other firms own their limits and pay only the cost of cutting and transporting the material. The prices, however, can be depended upon to indicate any important change from year to year.

Table 5 shows the extent to which Canada exports raw or unmanufactured pulpwood. The figures are based on information received from the Department of Customs for the calendar years 1912 and 1913.

TABLE V.

CANADIAN PULPWOOD EXPORTED UNMANUFACTURED vs. THAT MANUFACTURED IN CANADA, 1912 and 1913:
Quantity, Average Value per Cord, and Per Cent Distribution.

	1912				1913			
	Quantity	Value	Val. per Cord	Per Cent	Quantity	Value	Val. per Cord	Per Cent
	Cords	\$	\$ c.		Cords	\$	\$ c.	
Canada:								
Production.....	1,846,910	11,911,415	6 45	100 0	2,144,064	14,313,939	6 68	100 0
Manufacture.....	866,042	5,215,582	6 02	46 9	1,109,034	7,243,368	6 53	51 7
Export.....	980,868	6,695,833	6 82	53 1	1,035,030	7,070,571	6 83	48 3
Quebec:								
Production.....	1,330,670	8,371,923	6 29	100 0	1,432,594	9,495,165	6 63	100 0
Manufacture.....	578,855	3,386,705	5 85	43 5	629,934	4,107,689	6 52	44 0
Export.....	751,855	4,985,218	6 63	56 5	802,260	5,387,476	6 71	56 0
Ontario:								
Production.....	246,282	1,692,662	6 87	100 0	405,943	2,822,859	6 95	100 0
Manufacture.....	173,903	1,235,343	7 10	70 6	321,244	2,297,389	7 15	79 1
Export.....	72,379	457,319	6 32	29 4	84,699	525,470	6 20	20 9
New Brunswick:								
Production.....	202,942	1,492,567	7 35	100 0	194,674	1,449,525	7 45	100 0
Manufacture.....	52,041	287,060	5 52	25 7	53,121	342,243	6 44	27 3
Export.....	150,901	1,205,507	7 99	74 3	141,553	1,107,282	7 82	72 3
British Columbia:								
Production.....	35,067	193,265	5 51	100 0	84,242	402,428	4 78	100 0
Manufacture.....	35,067	193,265	5 51	100 0	84,173	401,218	4 77	99 9
Export.....	.....	.....	.....	.....	69	1,210	17 54	0 1
Nova Scotia:								
Production.....	31,949	160,998	5 04	100 0	26,611	143,962	5 41	100 0
Manufacture.....	26,176	113,209	4 32	81 9	20,562	94,829	4 61	77 3
Export.....	5,773	47,789	8 28	18 1	6,049	49,133	8 12	22 7

In 1912 Canada manufactured 46.9 per cent. of her pulp wood in her own mills. In 1913 this percentage increased to 51.7 per cent., and for the first time in the history of the industry more than half of the pulpwood produced in Canada was manufactured into pulp in Canadian pulp mills.

During 1913 each province, except Nova Scotia, used an increased proportion of its pulpwood for home manufacture. The greatly increased production of pulpwood in British Columbia together with the fact that this province manufactures practically all (99.9 per cent.) of its pulpwood at home, is largely responsible for the increased proportion for the whole of Canada.

Laws exist in Ontario whose strict enforcement has checked the export of raw pulpwood. In this province 79.1 per cent. of the pulpwood is used in home manufacture. The exports of raw pulpwood have increased in Nova Scotia from 0.3 per cent. in 1911 to 22.7 per cent. in 1913. Laws prohibiting the export of raw pulpwood from Crown Lands in Quebec came into force in September 1, 1910. Since that time the export for the province has decreased steadily from 69.4 per cent. in 1910 to 62.0 per cent. in 1911, 56.5 per cent. in 1912, and 56.0 per cent. in 1913. This proportion probably represents approximately the proportion of pulpwood cut on Crown Lands and privately owned lands, and may remain stable for some time. In New Brunswick the restrictive legislation of October 1st, 1911, checked the export of raw material, and in 1913 a slight increase in the proportion of pulpwood consumed in the province is to be noted. This province

still exports a greater proportion of its pulpwood in the raw state than any other.

Canada exported in 1913 to the United States 1,035,030 cords of unmanufactured pulpwood valued at \$7,070,571 or at \$6.83 a cord. Canadian pulp manufacturers operated 65 mills in that year. If the exported material had been manufactured into pulp in Canada it would have been sufficient to supply 60 mills each consuming 17,062 cords of pulpwood, the average consumption of Canada's 65 mills in 1913.

Canadian pulpmill operators paid an average price of \$6.53 per cord for their raw material. The exporters received only 20 cents a cord more than this for the wood sent to the United States.

This 1,035,030 cords of pulpwood, if manufactured into pulp would have made 1,035,030 tons of ground wood, or 517,515 tons of chemical fibre. Groundwood pulp is worth at least \$14.00 a ton, which would give \$14,490,420 as the value of the pulp made from the wood exported in 1913. Had this wood been made into value would have been \$19,665,570. In reality only chemical fibre at an average price of \$38.00 a ton its \$7,070,571 was received for this wood. The pulp industry lost the profit which could have been made by manufacturing this wood into pulp, and the country at large, lost the money which would have represented the cost of manufacture in the form wages, etc.

Wood-Pulp.

Table 6 shows the details of the export of manufactured wood-pulp from Canada in 1912 and 1913. The figures were furnished by the Customs Department.

TABLE VI.

EXPORT OF WOOD-PULP, 1912 and 1913, Quantity, Total Value, Average Value per Ton, Per Cent Distribution, and Country to which Exported.

Kinds of Pulp and Countries to which Exported	1912				1913			
	Quantity	Value	Av. Val. per Ton	Per Cent	Quantity	Value	Av. Val. per Ton	Per Cent
Wood-Pulp Exported Aggregate.....	384,100	5,952,361	17.10	100.0	298,169	5,913,560	19.83	100.0
Total Mechanical Pulp.....	295,449	3,991,365	13.51	84.9	230,644	3,317,565	14.38	77.4
Total Chemical Pulp.....	52,651	1,960,996	37.24	15.1	67,525	2,595,995	38.44	22.6
Total to United States.....	218,936	4,525,569	20.67	62.9	198,110	4,471,939	22.57	66.4
Mechanical.....	167,448	2,607,589	15.57	...	137,922	2,150,227	15.59	...
Chemical.....	51,488	1,917,980	37.25	...	60,188	2,321,712	38.57	...
Total to Great Britain.....	127,981	1,384,893	10.82	36.8	92,916	1,172,750	12.62	31.2
Mechanical.....	127,945	1,383,026	10.81	...	92,722	1,167,338	12.59	...
Chemical.....	36	1,867	51.86	...	194	5,412	27.90	...
Total to Japan.....	1,046	36,665	35.05	0.3	7,031	265,071	37.70	2.4
Mechanical.....	56	750	13.39	...	...	...	...	...
Chemical.....	990	35,915	36.28	...	7,031	265,071	37.70	...
Total to China.....	116	4,294	37.02	*	112	3,800	33.93	*
Chemical.....	116	4,294	37.02	...	112	3,800	33.93	...
Total to New Zealand.....	21	940	44.76	*	...	...	...	...
Chemical.....	21	940	44.76	...	...	...	...	...

* Less than one-tenth of one per cent.

The export of wood-pulp from Canada decreased from 1912 to 1913 by 22.4 per cent. in spite of an increase of 25.2 per cent. in the quantity manufactured. This would seem to indicate increased activity in the domestic manufacture of paper. Decreases are to be noted in the exports of pulp to the United States, Great Britain and China. New Zealand did not import Canadian pulp in 1913. The only increase reported was in the export of chemical pulp to Japan. The United States still takes about two-thirds of our pulp, of which about 70 per cent. is ground wood. Great Britain takes a little less than a third of the total and her importations are almost entirely ground wood or mechanical pulp. The exports to Japan and China in 1913 were of chemical fibre only. Altogether 77.4 per cent. of the pulp exported was ground wood and the remaining

22.6 per cent. chemical fibre.

The average price of ground wood pulp increased by 87 cents and that of chemical fibre by \$1.20, from 1912 to 1913. The price of mechanical pulp exported to the United States increased by only 2 cents a ton while the increase to Great Britain was \$1.78. The price of chemical fibre exported to the United States increased by \$1.32 and to Japan by \$2.65. The chemical pulp exported to Great Britain was valued at a little more than half the value in the previous year. A reduction in price of \$3.09 was also reported for the pulp exported to China.

Table 7 gives the details of the imports of wood pulp into Canada from various countries. The figures were supplied by the Customs Department.

TABLE VII.

IMPORTS OF WOOD-PULP, 1912 and 1913: Total Value, Per Cent, Distribution, and Countries from which Imported.

COUNTRIES FROM WHICH IMPORTED	1912		1913	
	Value	Per Cent	Value	Per Cent
Total Value of Imports.....	\$ 172,797	100.0	\$ 356,862	100.0
United States.....	100,234	58.0	303,543	85.1
Sweden.....	64,419	37.3	36,843	10.3
Great Britain.....	4,764	2.7	10,197	2.8
Germany.....	2,546	1.5	3,886	1.1
Norway.....	...	...	1,387	0.4
Switzerland.....	...	...	1,006	0.3
Austria-Hungary.....	\$34	0.5	...	...

The imports of wood-pulp into Canada in 1913 were valued at \$356,862.00, as compared to \$172,797.00 for 1912. This is an increase of over 100 per cent., the

imports from the United States having more than tripled during 1913. The importation from Great Britain more than doubled and those from Germany increased

by over half those in 1912. The importations of wood-pulp from Sweden decreased by 42.8 per cent. Pulp was imported from Norway and Switzerland in 1913, but not in the previous year. No pulp was imported from Austria Hungary in 1913. The United States in 1913 supplied over four-fifths of the total (85.1 per cent.) as compared to over a half in 1912.

EXTENSION WORK IN FOREST CONSERVATION.

Eight thousand school teachers representing every State in the Union are to receive general instruction in forest conservation at the mid-summer meeting of the American Forestry Association at Chautauqua, New York, on Thursday and Friday, July 9th and 10th.

The teachers will be told how forest fires which now cause an annual loss of seventy human lives and twenty-five million dollars may be prevented by the kind of educational work the Association is doing; and this instruction will be emphasized by moving pictures of forest fires and methods of fighting them.

They will also be told how lumber is made and moving pictures will play a large part in this description,

while there will be other pictures graphically showing what the soil, the water and the forests mean to the Nation.

The battle for life which the trees of the forest wage from the time they are tiny seedlings until they have attained their full growth will be described with pictures by Dr. H. E. Fernow, of the University of Toronto, and E. T. Allen, an expert on Pacific Coast forest conditions, will describe to the teachers the close relation between the forests, timber, and the people of the country. Charles Lathrop Pack, a Director of the Association, and former president of the National Conservation Congress, will make an address on forest conservation, and Prof. J. S. Toumey, Director of the Yale Forest School, will discuss the teaching of forestry in the public schools. J. E. Rhodes, of Chicago, in telling how lumber is made, will deal with the problems of the lumbermen. Capt. J. B. White, of Kansas City, will speak on the lumbermen's attitude toward forest conservation, and Dr. Henry Sturgis Drinker, President of the Association and President of Lehigh University, will tell about the work which the Association is doing in educating the people of this country to a proper realization of the value of trees.

POWER DEVELOPMENT AT GRAND' MERE

At Grand Mere on the St. Maurice River, the Laurentide Company is making rapid progress towards the immense task of harnessing the whole breadth of the broad stream which gives power to so many industries in Montreal and other centres. The work, which was

of comparatively still water through which the new dam will be constructed. Heretofore the head of water has been 45 feet made by three dams of 250 ft., 75 ft., and 350 ft. length respectively and on these the Laurentide Company has built up its present busi-



As lower site appeared July 9th, 1914. From left to right may be seen present power house, present dam, suspension bridge, cable tower, cofferdam (below), main island, crushing and mixing plant, main channel of St. Maurice.

begun in January, 1914, is superseding the original dam and power house which took in the western shore of the river and allowed the main channel to remain unharnessed. The point at which the power development is being conducted is between two islands, one of which is the famous Grand Mere bearing the rock which has a remarkable resemblance to that of an old woman and the other a high rocky island of a triangular shape about 900 feet across. At this point the river is 1,000 feet wide with a bay on the eastern side

ness. The change which will be made involves the erection of a power house 457 feet long by 137 feet wide which will extend diagonally across the stream at a point 200 feet further down the river than the present dam and from the channel corner of the power house will extend a dam 1700 feet long which will stretch across the three principal channels and the length of the large island. At the deepest part near the power house the dam will be 65 feet high and at the shallowest where the dam will cross the large island it will

be only 4 or 5 feet high. In order to make the surface regular, a triangular area 400 feet by 300 feet of solid rock will be blown off the top of the island.

This new development is one of the largest in the country. A total head of 77 feet will be maintained

tension rooms. At the top will be the gate house con-



2. The old channel of the St. Maurice, where the first development took place. In the background the Grand Mere Rock. This rock is now being transferred in sections and set up on the hill in the town of Grand Mere.

and with the nine units developing 20,000 horse power each, there will be available a total power of 180,000 horse power, of this only 120,000 horse power will be developed at the present time. The power house will consist of one main containing generators and an upper story with the switchboard, transformer and high



3. Power house excavation with draft tubes practically complete December 5th, 1913.

trolling the spillways for the overflow. The work has gone ahead with full activity under the direction of the George F. Hardy Company, the Consulting Engineers, and the Contractors, The Talbott Construction Co. The beginning was made a year and a half ago when the cofferdam below the falls, the excavation for the tail race and power house were made, and



4. The most recent view of the work, showing the site of the power units.

the construction camps were installed. These construction camps are a unique feature of the work. They are located on the far side of the river from the present mill site and are fully equipped with crushers, blacksmith shops, carpenter shops, stone bins, etc. The rock excavation from the river bed and the island is handled by means of large flat buckets on a heavy cableway 1650 feet long with a 2 $\frac{3}{4}$ inch cable suspended from towers 150 feet high right across the river. 400 cubic yards of concrete is being mixed and placed daily



5. A close view of a draft tube.

and the excavation and crusher capacities are keeping up with this. The rock is transported to the crushers on the far side of the river and is returned to the construction in the form of concrete by another cable of 1120 feet span which is directly over the dam. Last summer and spring were spent in excavation and a certain amount of concrete work was effected. The steel work on the power house was begun about the first of April and has been proceeding rapidly. At the



6. The operation on October 20th, 1913.

present time the new travelling crane which is to be used for the installation of the power units is being supplied by the J. P. Morris Company is in place and working satisfactorily. The draft tubes were completed the last of February. At the present time the pen stocks and spiral dischargers and practically all the concrete foundation for the power house are in place and will have further development almost immediately. One hundred and seventy-five feet of the dam at the high water part is half completed and a beginning has been

made on the far side of the river clearing out the bank for the purpose of putting in the eastern section of the dam. The mixer is ready to handle this part of the work. The next step will be to put in the cofferdam on the main floor of the river at the wide channel on the east side. At this point the water is about 15 feet deep and running very fast. The installation of the cofferdam will involve a great deal of difficulty. While the working on the dam is completing and the stream is blocked, the water will find its course through a channel which is being excavated through the centre of the island. Down this passage the logs for other firms on the St. Maurice will pass. The force of men, it is expected, will be increased as the work proceeds. In all about 925 are at present employed. It is expected that the work will take close on to a year for completion. When it is finally finished, the St. Maurice Valley can boast of a power plant equal in capacity to that at Keokuk, Iowa, which dammed the whole Mississippi and cost nearly thirty million dollars. The Laurentide Company will be in a position to sell considerable surplus power and so to extend the fields of the industry in the St. Lawrence Valley.

A CATALOG WORTH HAVING.

A most comprehensive catalog telling in an interesting way the mission of the Recording Thermometer in the modern industrial plant and its great value in promoting vigilance on the part of operators in charge of processes in which the maintenance of a certain temperature is important to the quality of a product or the efficiency of the process enables intelligent supervision of these processes from the desk of the Manager, Superintendent, or the party in charge—the man whose duty it is to attain maximum efficiency and production with minimum expense from the plant under his management. The catalog is profusely illustrated showing the numerous types of "Columbia" Recording Thermometers. The many new features of the "Columbia" outlined will be found to be departures in Recording Thermometers construction. The Removable, Adjustable and Compensated Recording Pen Arm is an improvement of great value. It makes chart changing easy and eliminates the possibility of errors due to temperature changes at the Recorders ease.

The new patented fume and moisture proof insulation for the steel connecting tubing of the "Columbia" is worthy of note. It is a perfectly insulated tubing, practically indestructible and yet flexible. The "Day and Night" border chart which is winning so much popularity commands its share of interest. The catalog is certainly worth having, especially by those seeking to attain efficient and economical management. A copy may be had by request to The Schaeffer and Budenberg Manufacturing Co., Brooklyn, N. Y.

NEW CANADIAN OFFICE.

On the first of July, Joseph H. Wallace & Company, Industrial Engineers, Temple Court Building, New York, Salisbury House, London, E. C., are opening a Canadian office at 904 New Birk's Building, Montreal. The new office will enable them to handle to the very best advantage engineering work for the Canadian pulp and paper mills. The office will be in charge of two members of the firm, Joseph P. Fox and T. R. H. Murphy, who for a number of years have been in close touch with work in Canada and with Canadian manufacturers.

"SAFETY FIRST"

By J. F. H. WYSE

Organizer and Engineer, Ontario Safety League

Before Convention of Canadian Electrical Association.

The term "Safety First," is said to have been originated by the United States Government, in a nationwide movement, during 1908, to reduce accidents in coal and metal mines. It is estimated that there were, during the years 1908-9-10 and 11, on account of this campaign, 51,400 lives saved.

"Safety First" is the slogan under which many Safety Leagues, Safety Committees and Associations of today are conducting vigorous campaigns for the prevention of accidents.

The movement is almost universal (at least as far as civilized countries are concerned). Its objects are good—the saving of life and limb.

Historical.—For centuries the ingenuity of man has sought out many inventions to perfect machines for almost every conceivable purpose; however, neglecting the greater care and conservation of the finest machine of all, namely, the human being. To produce the finished article, the laborer, the mechanic, the artisan, the engineer—in fact, all the human element used in factories of every description—had been, up to recently, seriously neglected. The wonderful human machine and its care had been held cheaper than the mere mechanical device.

We have to give the little country of Holland the credit for taking the initiative in accident prevention, in a crusade for human safety and for setting the whole world an example in this laudable work. In the year 1893 a few enthusiasts rented a small dwelling, and secured and placed therein some photographs, models, drawings and actual machines, with devices and attachments, showing their dangers and how to avoid these dangers in operation. At the present time this organization occupies a new and commodious building in Amsterdam, opposite the Rijks Museum.

Berlin was the next to fall in line, and in 1903 established a Museum of Safety Appliances, which stimulated the public interest. Such success was attained by these museums that the Government soon took them over and looked after their maintenance and enlargement. Today this Berlin Museum is said to be the finest of its kind in the world.

Shortly afterwards Germany established similar museums in Munich and Dresden, and today Germany is said to have solved the great problem of public safety. What Germany has done, we have yet to accomplish.

The American Museum of Safety, with its head office in New York City, established in 1908, is a vigorous child of this Dutch and German parentage. There are now at the following places, some twenty-two, or more, of these institutes for the promotion of Safety and Hygiene—Amsterdam, Berlin, Barcelona, Brussels, Budapest, Copenhagen, Dresden, Frankfort-on-the-Main, Gratz, Helsingfors, London, Milan, Moscow, St. Petersburg, Stockholm, Vienna, Wurzburg, Zurich, Paris (two), New York City, and, last but not least, Montreal.

Industrial.—The class of industrial accident prevention is divided and sub-divided as follows:—

1. General—Boilers, Containers, Steam Piping, Power Machines, Transmission, Electricity, Elevators and

Hoists, Personal Equipment of Workmen, Miscellaneous.

2. Particular—Mining, Quarrying and Excavation, Blast Furnace and Foundry, Woodcutting, Stones and Clays, Paper and Printing, Agriculture, Transportation by Land, Transportation by Water, Metal Working, Building Trades, Chemical Industries, Textiles and Clothing, Foodstuffs, Building Trades, First Aid to the Injured.

In addition to these groups, the operations of the institutes are devoted to Industrial Hygiene, covering apparatus and instruments for the testing of air, light and water, miscellaneous, ventilation, infectious diseases, tuberculosis, water closets and lavatories, exposition of substances detrimental to health, lighting, exhaust for dust and gasses, baths, dining rooms, clothing and the personal equipment of the worker.

Also Mutuality of Social Hygiene, covering, improved dwellings, service annuities, foodstuffs, miscellaneous.

In the industrials of Europe it is conservatively estimated that the "Safety First" movement has reduced accidents at least 50 per cent, and the work has done with the firm belief that "Every life saved is a national asset."

Expenses caused by accident are a burden to the taxpayer, and saving along these lines is a "balance on the right side of the ledger."

Dr. Zacher, director of the German Imperial Bureau of Statistics, makes the following statement: "One billion marks (nearly \$250,000,000) is saved in wage-earning efficiency annually in Germany through our sanatoria, museums of safety, convalescent homes and other forms of social insurance, by which we safeguard the lives and limbs of our workmen, and prevent the cause and effects of disease, which would lessen their economical efficiency. Some of our industrials and manufacturers are waking up to the fact that prevention of accidents pays, and that it is far cheaper and more economical than compensation."

Dr. Tolman, Director of the American Museum of Safety, and author of a volume entitled "Safety," to which I am indebted for much information contained herein, says: "A recent case brought to light the fact of how one manufacturer, after the inspector's report had been received, left a floor pit uncovered. Shortly afterwards a workman fell into it, and received \$15,000 damages. Literally, a wooden hand rail at the top of this precipice would have cost \$5; the ambulance at the bottom cost \$15,000."

In Germany, every employer must belong to the trade association of his business. He pays to the association an accident premium, which is an insurance of his workmen's safety, and he, the German employer, knows after twenty-five years experience, that any accident is sure to be thoroughly investigated, and the first question asked will be, "Was there a proper safeguard provided?"

The Industrial Safety Campaign has brought about improved illumination and safety in miners' lamps; the safeguarding of emery wheels, buzz planers, grinding wheels, circular saws, band saws, woodworking tools, lathes, cranes, cars used in shops, are lamps, scaffolds, manholes, steam boilers and valves, and has resulted in safeguarding railway yards, shops and locomotives. One large plant has the following sign:—

"TO MEN SEEKING EMPLOYMENT."

"Unless you are willing to be careful to avoid injury to yourself and fellow workmen, do not ask for em-

employment. We do not want careless men in our employ."

The United States Steel Corporation employs over two hundred thousand men. Immediately after the year 1906 they started a "Safety First" campaign for the prevention of accidents, and have saved, since then, nine thousand lives and serious injuries, making a total reduction of 46 per cent. This answers the question, "Is it worth while?"

Safety.—Many railways and street railways in the United States and Canada have organized a safety movement to conserve, not only the public but their own employees. The results have been so successful that it is said "Once a 'Safety First' movement is started, it is never abandoned, but goes on increasing its work and widening its scope." One of these railroads saved one hundred and seventeen lives and seventy-five hundred injuries in a campaign of some forty months; and a street railway, by letters to automobile owners and teamsters, reduced its street traffic accidents in one month about 40 per cent.

Central Electrical Stations and Line Operation.—There is not much danger around the Central Station if proper precautions are used, but there should be rules to govern the handling of all lines, wires, cut-outs and switches, and these rules should be strictly observed. A good rule for the operator in the station is to cut-out or dead-end a line or section on the order of anyone, but never to cut-in again without orders from the head of the crew or the personal order of the one who called for the cut-out.

The engines, if any are used, should be completely guarded with railings, and all belts should be carefully protected from possible contact.

Every person who handles high voltage wires at any time should be instructed as to the danger, and shown how to break a circuit without endangering his own life, and also should be taught the "Schaefer" method of resuscitation.

For pulling fuses on high tension wires, or replacing same, sticks should be provided with hooks on the end, to ensure a good grip, and rubber gloves should be used always.

When fuses are to be pulled in cellar, or tunnel, or any other place, it is better to have at least two men working. One man should never go into a dangerous place without notifying some fellow workman. On dynamos and generators rubber mats should be placed around the base for the operator to stand upon while alone in adjusting the machine.

Where the operator steps upon the base to examine or adjust the brushes or other parts, there should be a secure railing between him and the revolving parts of the machine, and the base should be filled so as to prevent his slipping and getting inside the frame.

Where there are dangerous wires exposed in cellars or tunnels that are forbidden as passages, it is a good custom to cover the floor with a light sprinkling of white dust every morning. This will show the foot-prints of any person who disobeys the orders. Such accidents are sometimes very handy shortcuts, and the wire will slip through and may get shocked.

A lantern should be part of the equipment of every station, and should be kept always ready for use, and the station—cellars should be thoroughly and peacefully lit in the day.

Every wire, whether protected or not, should be carefully examined. Absolutely no night should be given its outside illumination as an accident preventive.

This has too often proved "a delusion and a snare." It would be an excellent thing for the Central Station to run, from time to time, in the daily papers, advertisements dealing with the "Dangers of Overhead Wires and How to Avoid Them."

In Germany 34 per cent. of all reported accidents in 26 years were caused by ladders. Make sure that all ladders used inside and outside the station, or on the line, are provided with safety points or ladder shoes.

General. Based upon accident prevention work in the United States, and what they have accomplished, similar work in Canada would effect a vast economical and social saving.

Money is being freely spent by our Governments on Forests, Game and Fisheries, while our wage-earners, when hurt through avoidable accidents, become a burden upon the taxpayers and objects of charity. Would not some of the public money spent to prevent these accidents be a good investment? Educational and legal prevention of accidents and disease by sanitation is better and more economical than the cost thereof after accidents have occurred. In other words, "An ounce of prevention is worth a pound of compensation."

It becomes more easy to obey rules for safety when their importance and wisdom is realized than if they are to be regarded as mere rules. We must wake up here in Canada, as they have done in some other parts of the world, to the subject of conservation of human life and limb.

There is nothing in the "Safety First" Movement of a political or partisan nature. Its aims are to invite all creeds, parties and interests in a universal endeavor to safeguard life and limb. The work is in no sense revolutionary, but proposes to accomplish its objects by sane and conservative methods: to make suggestions, to give warnings, to get the co-operation of all the people all the time, and to secure their moral and financial support as an investment that has paid, and will still continue to pay.

The remedies are to educate the public to make Safety their first consideration. We teach them:—

Through the columns of the daily papers and periodicals.

By letters and cards of instruction to autoists and teamsters.

By getting the ministers to preach "Safety First" sermons.

By posters and stencilled signs in conspicuous places.

By popular lectures, and by the distribution of circulars, blotters, and "Safety First" buttons, and by securing the best traffic legislation and its enforcement.

Lectures and moving pictures to school children are one of the best ways to get at the public, and by the children the idea is taken practically into all our homes, the parents' interest is thereby awakened, and the objects of "Safety First" secured.

REMOVING ROSIN FROM UNBLEACHED PULP.

A patent has been obtained in Germany on a process for removing rosin from unbleached sulphite pulp. After the liquor has been blown off the pulp is washed and then mixed with suspension of talc or asbestos dust, or a mixture of both, preferably together with some petroleum, and heated in the boiler under a low pressure, after which it is centrifuged and washed.

Dam Breaks on Upper Ottawa

Ottawa, Ont., June 27.

A serious accident has occurred to the Dominion Government dam built at the foot of Lake Temiskaming for conservation purposes, and as a result the level of the Ottawa River has temporarily risen below the break, while that of the lakes above have gone down from 6 to 10 feet. Every lumber and pulp industry along the Ottawa River will be affected.

About 120 feet of the big dam at the point referred to has gone out, through some cause, which has as yet not been found. This falling away includes three piers on the Quebec side of the dam in the deepest part of the channel, about 60 feet of sluice gates and sixty feet of piers. The accident occurred as a result of the undermining of a pier underneath the "apron" of the big structure, and took place without warning. A large volume of water was immediately released, which flowed down the Ottawa and considerably down its level for the time being. As an immediate result, also the water fell in Lake Temiskaming, which is now between 6 and 10 feet lower than before. It is feared that navigation on the lake will suffer in consequence. A new wharf built at Ville Marie, it is expected, will be left dry, as will be another new wharf at Paradise Bay.

The dam went out on Sunday, the 14th. Stored in the reserve of water near the dam at the time the break occurred was a large supply of logs belonging to different Ottawa Valley companies, which have been held up by the lowness of the water. Lumbermen, in fact, had been complaining for some time past there was not enough water in the river to float their timber and some of them, including Gilnour & Houghson and the W. C. Edwards Company of Ottawa, had been promising to close down their mills unless a larger supply were obtained. To some people as well as to other lumber and paper firms with logs on the river, the break came as a rather welcome occurrence, since it supplied a temporary, least suffered to meet their needs. This will be the case for some time until sufficient progress has been made with the repairing of the dam to hold the outflow back.

The Temiskaming dam to which the accident occurred was built five years ago and this is the second break which has taken place. About two years ago the first incident of the kind occurred though the structure has always given the engineers more or less trouble. The dam was commenced under the former Government and continued under the present one. It has been claimed in some quarters that the location chosen for it was unsuitable since gulches existed thereon. The Ontario side of the dam was let by contract while the Quebec side was undertaken by the Government.

The big structure is divided into two parts, one in the Ontario channel and the other in the Quebec channel and each is about 400 feet long. There are 16 twenty-foot sluices on one side and 14 on the other while the piers are about 30 feet high. The cost of construction was \$300,000 and an unofficial estimate of the damage done and the sum necessary for repair work does not place it much below \$40,000.

Mr. C. R. Coutlee, in charge of conservation and regulation work on the Ottawa River, was seen by your correspondent, and stated that it was expected the dam could be repaired by the end of July. He pointed out that it was rather the bottom which had wasted

out than the dam itself which had broken. As for the results to lumbering operations, Mr. Coutlee stated that while the break would temporarily benefit them, it would work to their detriment in September and the fall months, when as a rule there is sufficient head stored behind the dams at Lake Temiskaming and Kippewa to maintain the level. Mr. Coutlee also stated that this was absolutely a record year in the Ottawa, and that unless there was heavy rains in July and August the situation would be more serious than any other, which power users on the river have faced in past years.

-MAC.

VETERAN PAPER MAKER ON VACATION.

Mr. Robt. Aitken resigned his position as Superintendent of the Canada Paper Co.'s book and writing paper mill, at Windsor Mills on June 15th. After a service of twenty-four years, fourteen years as beater



MR. ROBT. AITKEN

engineer in the bag, manila, fibres, water finish and news print mill, and two years as Superintendent of the same mill, after which he was promoted to be Superintendent of their fine book and writing mill, with two machines, one white and colored bonds, fine arts and featherweights, the other on colored posters and covers, mottled fibres, water finished fibres and kraft. This latter position was held by him with great success for eight years, up to the time of his resignation.

With his wife and daughter he will sail on the Allan S. S. Grampian on July 4th for Glasgow and will take a well earned rest for a few months before returning to Canada. He intends visiting many of the principal paper mills in Scotland and England to see if he can gain any hints that may be useful to him on his return to Canada, especially in the manufacture of blottings and featherweights, and the use of stone beater rolls on ground wood and other fibres.

Canadian Forestry Convention

Mr. James Lawler, Secretary of the Canadian Forestry Association, is actively engaged in forwarding arrangements for the convention to be held in Halifax on September 1-4. A recent report states:—

"From those who have already signified their intention of attending the Convention at Halifax, it is evident it is going to be one of the best yet held. A number are going to make it a holiday trip, on which they will take their ladies, as well as an occasion to help along the cause of forest conservation. The Secretary is shortly making a brief trip to Nova Scotia to make preliminary arrangements.

Railway arrangements are on the Standard Certificate Plan. By this delegates purchase one-way first class tickets to Halifax and secure a certificate from the railway agent selling the ticket. These certificates will be signed by the Secretary at the Halifax Convention, and when thus signed will be honored for return tickets to the starting point.

From and including Fort William, Ontario, eastward tickets will be on sale at all railway stations in Canada Aug. 28 to Sept. 3, inclusive, and properly validated certificates will be honored at Halifax for tickets for the return journey up to and including September 8.

In Western Canadian territory, (namely, west of Fort William to the western boundary of Alberta), the dates of sale will be August 24 to 27, inclusive. Properly validated certificates will be honored for return tickets at Halifax up to and including September 19 for tickets back to starting point.

From British Columbia points the dates of sale will be August 22 to 26, inclusive. Properly validated

certificates for return tickets will be honored at Halifax up to and including September 19.

These dates for British Columbia and Western Canada points will accommodate those desiring to travel by steamer across the Great Lakes. The usual arbitrariness will apply for passengers desiring to use the lake route.

Delegates are requested to acquaint themselves thoroughly with these dates and rules, as failure to observe them will render it impossible for them to get the reduced rate. The Secretary is anxious to get the names of those who expect to attend, and will gladly give information on any point not clear. His address is Journal Building, Ottawa.

TRADE INQUIRIES.

There have been received by the Department of Trade and Commerce, the following inquiries relating to Canadian trade. The names of the firms making these inquiries, with their addresses, can be obtained only by those especially interested in the respective commodities upon application to: "The Inquiries Branch, The Department of Trade and Commerce, Ottawa."

496. **Kraft wrapping paper.**—A London firm have an important inquiry for Kraft wrapping paper for shipment to New Zealand, and invites samples and quotations from Canadian manufacturers who can offer supplies for prompt shipment.

523. **Paper wrapping.**—Samples and prices are asked for by a South African importer.

524. **Paper bags.**—A South African importer asks for samples and prices on Canadian paper bags.

Correspondents are requested to mention the Reference number of the inquiry.

NEW ONTARIO PULPWOOD SHIPMENTS SHOWED GREAT FALLING OFF IN MAY.

Cobalt, Ont., June 17. There is a great falling off in the number of cars, and the number of cords of pulpwood shipped during May of this year compared with the May of last year. This is probably due to the fact that the season is so much more favorable for the working of the land, and that the greater clearances require more attention.

Shipping Point.	Destination.	1913.	1913.	1914.	1914.
		CARS.	CARS.	CARS.	CARS.
Latchford	Niagara Falls.	42	630	67	972
Gullies Depot	Sturgeon Falls.	..	..	2	24
North Cobalt	Latchford.	..	..	1	12
Haileybury	Johnsonburg.	..	..	1	14
New Liskeard	Johnsonburg.	..	..	3	38
Uno Park	Thorold.	1	12	..	..
Earlton	Sturgeon Falls.	2	24	..	..
Earlton	Thorold.	2	25	..	..
Earlton	Merrittton.	2	25	..	..
Earlton	Latchford.	33	400	2	261½
Earlton	Port Huron.	..	..	2	25½
Headship	Latchford.	5	66	..	..
Englehart	Thorold.	..	..	1	12
Englehart	Johnsonburg.	..	..	8	111
Charlton	Thorold.	4	54½	1	12
Charlton	Latchford.	..	..	4	51
Matheson	Sturgeon Falls.	..	..	3	40
Matheson	Latchford.	..	..	12	151
Porcupine Jet	Sturgeon Falls.	2	31	1	10
Porcupine Jet	Latchford.	7	96	2	27
Cochrane	Thorold.	26	451½	..	..
Cochrane	Latchford.	5	75½	1	13
Total		131	1890½	112	1500½

67, 972
50.

151
240

Convenient Method of Handling Chemical Solution in Quantity

C. E. Phelps, M.E., in "Metallurgical and Chemical Engineering."

When acids and other chemical solutions of a corrosive nature must be lifted or conveyed from one place to another, the relative advantages of different methods of accomplishing the desired result cannot be decided on the question of initial or operating costs alone, for the service may be so severe on certain types of apparatus as to render them practically useless in a short time. Frequent delays for repairing may also occasion great losses due to the stoppage of manufacturing processes. Ordinary reciprocating and rotary pumps are often out of the question, even when constructed of special material of a non-corrodible nature.

A device known as a monteju, which is operated by either air or steam pressure, has been used to some extent for this purpose and is fairly satisfactory; but it is open to the objection that it has valves, floats and other

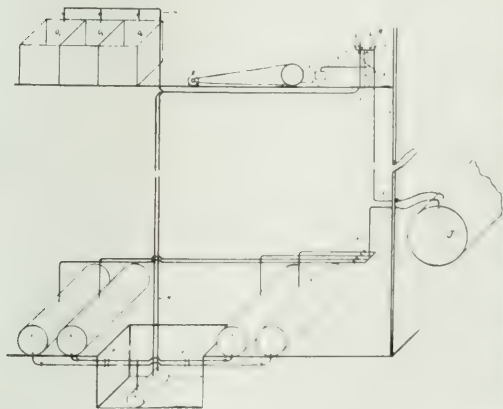


Fig. 1.

moving parts in contact with the fluid. Other devices, using air or steam pressure, employ either the injector or siphon principle for their operation with more or less success, depending upon the requirements, but they, too, have certain limitations in practical use.

For handling chemical fluids in large quantities the method illustrated herewith has certain advantages which will be apparent from the description. The system illustrated in Fig. 1 is in use in a large Massachusetts textile mill, for raising heavy commercial oil of vitriol to bleaching vats on the third floor of a building. Compressed air is used, not only for this purpose, but also to empty the acid from the tank cars which are brought alongside of the building. The engineers in charge of this plant consider that the method which they have adopted is admirably adapted for its purpose.

Referring to the diagram, O_1 , O_2 , O_3 are lead-lined bleaching vats; they are partially filled with pure water, after which 100 gal. of the concentrated sulphuric acid is raised and added slowly to the water, the contents being stirred while the acid is being added;

then a small quantity of hydrochloric acid is added by hand from a carboy, after which the bleaching solution is ready for use.

Located near the vats is an air compressor A driven by a $2\frac{1}{2}$ -hp belted motor B. The compressor cylinder has a displacement of 15 cu. ft. of free air per minute and operates normally at 40 lb per square inch air pressure. The compressor, gauge, receiver and controlling valves are shown in the photographic view, Fig. 2.

The compressor discharges into a length of pipe C of large diameter, which acts as a receiver to steady the pressure in the line. Gauge Q indicates the air pressure in the line. Two air lines, I and F lead from the receiver. By closing all valves on the left of the

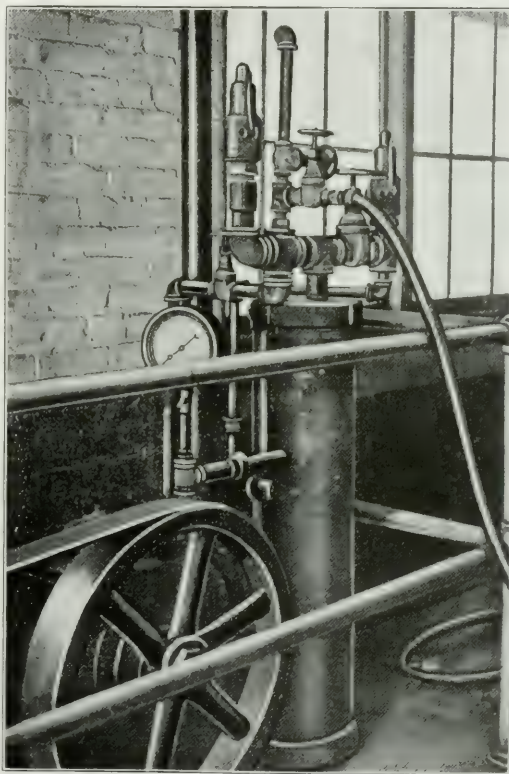


Fig. 2.

receiver outlet and opening valve R, pressure is put on pipe line I. The latter line leads to a connection whereby air pressure can be put on the tank of an acid car J. Safety valve E is set for 15 lb per square inch, so no pressure in excess of this amount can be put on the car tank. The car tank's outlet is coupled with pipe K leading from the outside of the building to four heavy iron reservoir tanks L in the basement of the mill. Each of the tanks L has a capacity of 3,500 gal. and is provided with air vents. With an air pressure of 15 lb., it requires about two hours to empty the car, capacity of which is usually about 5,000 gal.

Pipes lead from the bottom of the reservoir tanks to the top of a 100-gal. iron supply tank M placed a few feet below. In each of these connecting pipes is a check valve P to prevent the acid from returning to the large tanks. Leading from the top of the small tank is the air pipe F. Normally this serves as a vent, allowing the acid to flow into the small tank and fill it. When a charge of acid is wanted, this vent is closed by a valve S near its outlet G and air pressure is put on this line by opening valve T. The acid immediately begins to flow from the bottom of the 100-gal. tank up pipe N to the bleaching vat, a height of about 40 feet.

Correspondence

AMUSEMENTS FOR PAPER MILL TOWNSHIPS.

The Editor, Pulp and Paper Magazine:—

Canadian paper makers have at least one trouble, which those in more thickly populated countries do not feel so acutely: that is the difficulty, not so much in securing, but in retaining good help. Many of the mills are considerable distances from any large centres of population, where recreation and entertainments to suit all tastes can not always be enjoyed. The tendency of the present generation of paper mill workers is to require more variety and amusement than their fathers and grandfathers, before them, ever thought of, or wanted. It is undeniable that it is better for both mill owners and workers that as soon as they find that they can get on well together, that there should be as few changes as possible. Because each worker, of whatever grade, if he remains at one mill for a time, gets to thoroughly understand the working of his department, the temperament of his mates and bosses, and by the time he has got so far, he is pretty certain to identify himself with that particular mill, and take a very real interest in its success.

In Scotland and in England, where most of the mills are some distance from towns, many mill owners have for some time been endeavoring to make things more interesting in the home village for their employees. Some have been very successful in this way, and some have not, all depends on the way the business is handled. It very often happens that a certain amusement is started, goes splendidly for a year or two, then interest slackens off and finally expires. Something fresh should then be ready to come to the front.

Amusements may be divided into indoor and outdoor. Taking indoor first, we may enumerate a few: A lending library, combined with a reading room, billiards, checkers, chess, skittles, various card games, vocal and instrumental music, recitations, dances, lectures, etc., etc. For outdoor, there is rifle shooting, football, bowls, boating, picnicking, and all the winter sports. So there is plenty to choose from in both summer and winter amusements.

There are different ways of organizing these amusements, but it is generally conceded that there is only one way of doing it successfully and that is jointly, by employer and employee for mutual benefit. The employees will find it to be in their interest to invest a certain amount of capital in building the necessary recreation building and fund, but when started if the business is to be run satisfactorily, and everybody interested in it, it must be run on self-supporting lines, by a committee representing all grades of employees. The duty of the committee in addition to finding amusements

for the male workers, would be also to do the same for the wives, grown-up daughters and the children.

Doubtless quite a number of your readers have spent one or more winters at some of the more inaccessible mills, and if the truth was told, many of them found it so dull, that they promptly began to feel unsettled and sought out another job, where they expected to find some doing in the amusement line. In summer things are not so bad, for people can get about, and are not compelled to keep under cover most of the time, but that the winter is somewhat tedious we cannot help admitting. Still, if the employees of a paper mill find it dull they have largely themselves to blame.

Few, if any, employers would decline to assist in helping to get up recreations for their people, for they are quite alive to the fact that it is better for the business and for everyone concerned that the continual changing of workers, should be avoided by all reasonable means, as no one makes money out of it except the railway companies, and nine times out of ten both employer and employee are out of pocket.

To start an amusement committee club or whatever it may be called, the employees should fully discuss the matter and then approach the Big Boss with moderate and reasonable suggestions to start with, and let the variety and extent of the entertainments increase, as the committee gain experience and the population show appreciation.

There ought to be about one entertainment every week during the winter months and an extra one thrown in every now and then.

It takes really very little trouble to get up a series of concerts, dances, an occasional popular lecture, a social evening now and then, special children's entertainments, and so on. There is always plenty of talent for amusing among the employees of any paper mill, although at first it generally takes some trouble to find it, but the more entertainments there are, the more easy it becomes to discover unsuspected talents.

It is quite true that "all work and no play makes Jack a dull boy," but nowadays the shorter hours worked at many paper mills dispose of the "all work" theory. Then we naturally ask ourselves, if Jack is a dull boy, why is it? He has plenty time for both sleep and play.

The trouble we fear is that many Jacks have never learned how to amuse either themselves or their friends. Hence the object of this article is to try and promote the more general use of intelligent and varied amusements and to try and obviate a lot of useless hanging round or in plain words loafing, during the time that should be devoted both to mental and physical development.

—ALEX ANNANDALE.

UNITED STATES DEPARTMENT OF AGRICULTURE AND KRAFT PAPERS.

Editor, Pulp and Paper Magazine:

It would appear from various bulletins issued by the United States Dept. of Agriculture that they are making very strenuous efforts to make the public believe in the superiority of longleaf yellow pine as a paper making material, and evidently in this way to build up the South as a paper making centre. This is a very praiseworthy object on the part of the Department of Agriculture, and one in which every broad-minded American wishes them success, but one cannot help thinking that the best interests of the South would be served by not painting too rosy a picture of the suit-

ability of Southern woods for the manufacture of Kraft Paper.

I have before me Bulletin No. 72 of the United States Dept. of Agriculture, Forest Service, and certainly think a more thorough investigation should have been made before such statements as those contained therein are made public; because, owing to the excellent work which has been done by the Dept. of Agriculture the public generally place absolute confidence in their bulletins, and in this way capitalists and investors who are not thoroughly familiar with the paper industry may be led into unfortunate investments.

On the strength of about a dozen tests made on quite a small scale, and on wood from only two localities the investigator says in conclusion: "That Kraft Papers can be made from longleaf pine equal or superior in quality to the imported and domestic Kraft Papers now on the market."

This is truly a remarkable statement, because it is not borne out by commercial facts; one Southern mill trying to make Kraft Papers by the Sulphate Process has had to close down permanently, and most of the Southern Kraft Paper now on the market sells from 10c to 50c less per hundred pounds than foreign Kraft or that made from Northern woods. Neither is this statement about the superiority of Kraft Paper made from longleaf pine proved by the results as reported in the bulletin; the best strength factor (average of five pop tests in pounds per square inch divided by weight per ream 24 x 36 - 5000) obtains by the investigator, table 1 is 0.93, the lowest 0.50, the other values of course ranging between these two. The strength factor demanded by the trade for a No. 1 Kraft Paper is at least 1.0, while the writer has recently tested samples of domestic Kraft made from Wisconsin woods, having strength factors ranging from 1.00 to 1.20.

In the bulletin nothing is said concerning the breaking length of papers obtained from longleaf pine, the writer has tested dozens of samples of paper made from Southern Pine on the Schopper machine, and has yet to meet one with a breaking length of 6,000 meters, the German standard for No. 1 Kraft. While domestic Krafts made from Northern woods (of which hundreds of samples have been tested) rarely go below this standard, the average having a breaking length of about 6,800 meters, or a little higher.

It would certainly be for the best interests of the South for the Dept. of Agriculture to state the facts as they are, namely that Longleaf Yellow Pine makes a good No. 2 Kraft Paper, and is also an excellent material for making box board, but at present it has to be demonstrated both commercially and experimentally that a good No. 1 Kraft can be made from it.

WALTER CLIFFORD,

Chemist to Wausau Sulphate Fibre Co., Mosville, Wisconsin.

ROPE AS STRONG AS STEEL.

Of the flexible ropes suitable for power transmission, a manila rope is just as strong as a solid steel bar, weight for weight, though only about 11½ per cent. as strong per equal cross-section. Leather, on the other hand, is only about 5 per cent. as strong as a steel bar of equal cross-section and less than 40 per cent. as strong per equal weight of material.

Records show that rope manufactured from the fibre of palms was used in Egypt long before the days of

Christianity. Such ropes were found in the tombs of Beni-Hassan, 3000 B. C., and on the walls of these same tombs are illustrations depicting the preparation of hemp. Carvings found in tombs in Thebes represent the process of making rope from thongs of leather, about 1600 B. C., and Assyrian sculptures of about 50 years later show gigantic hauling operations performed with rope. These records are of particular interest as indicative of the steps through which rope manufacture passed in the early ages.

The relative efficiency of manila rope and leather belting for the transmission of power is not directly proportional to their respective strengths, however, as the internal construction of a hemp rope and a strip of leather differ greatly and very differently by wear. Manila fibres from which the rope is manufactured, are usually from 8 to 10 feet long, are composed of elongated cells that possess great strength longitudinally, but are comparatively weak transversely. Leather, on the other hand, is about equally strong in any direction so that the wear on such a belt is mostly external. In a manila rope the wear is largely internal, the elongated fibre cells being crushed together when passing around a sheave and breaking up into short pieces. A worn-out manila rope, as far as its strength is concerned, may have the outward appearance of an excellent rope while internally in construction is but a mass of short, broken particles. The allowable working stress of a good leather belt is customarily taken as 320 pounds per square inch, or about one-tenth its tensile strength. In the course of a year or so a manila rope will lose about 50 per cent. of its original strength, after which the weakening becomes more gradual. Under such conditions it is safe to figure on an allowable working stress of about 288 pounds per square inch or 1/324 its tensile strength. —Power Magazine.

ABITIBI REGION RICH.

After a tour of inspection in the Abitibi region in North Western Quebec with a company of Cabinet members and Government officials Sir, Lomer Gouin, Premier of Quebec returned to Montreal with most enthusiastic reports of the region. On either side of the National Transcontinental there is an agricultural area which is equal in quality to many of the finest lands in Western Canada and this will be developed with great impetus to the pulp industry from the clearing of land for farms and the selling of the pulp wood is an undoubted probability in his mind. The establishment of pulp and paper industries even in this far north country is well within the range of possibility in the near future. The Premier was accompanied on his visit by Mr. G. C. Piche, Chief of the Forestry Division of the Department of Lands and Forests. Mr. Piche paid particular attention to the forest and pulp conditions and will be in a position to make a report as soon as the information has gone through the proper official circles.

PAPER AND PULP IN RUSSIA.

There are in Russia eighty joint stock companies engaged in the manufacture of paper with a collective capital of 55,000,000 roubles (\$28,325,000). The manufacture of paper from woodpulp is on the increase while the manufacture of rag paper is falling off.

Ottawa Notes

Ottawa, Ont., June 25.—A rather surprising but healthy condition in the Canadian paper trade is shown by preliminary figures for the fiscal year ending March 31 last, issued by the Trade and Commerce Department last week. These figures, which are of course not given in detail, indicate that in spite of the financial stringency which has prevailed during the past year, exports of Canadian pulp and paper products in 1914 were almost twice as great as in the fiscal year of 1913. On the other hand, imports have slightly decreased.

Paper of all kinds exported by Canada in 1914 totalled \$12,686,896 or almost double that of the previous year, \$6,327,774. The greater part of this amount, or paper valued at \$10,566,359, was sent to the United States, while \$510,818 went to Great Britain. The imports in 1914 were \$8,043,368, of which paper valued at \$5,423,037 was imported from the United States and \$1,687,839 from the British Isles. This is a slight decrease since 1913, for which year the figures were \$8,347,381.

Ritchie Brothers, of Aylmer, Que., whose large saw-mills were totally destroyed by fire some weeks ago, with a loss of about \$75,000, have decided to re-build. Mr. Ritchie has purchased a saw-mill from McKay Brothers, at Eardley, and this will be brought down. A large gang of men are now at work clearing away the debris to allow the work of re-erection to commence at once.

Before Parliament adjourned over a week ago an interesting discussion took place over the application of the North Shore Power, Railway and Navigation Company to change its name to the Gulf Pulp and Paper Company. It was explained that this company, which was originally incorporated by a private bill, carries on business in Quebec, where it employs about 800 men, and that it now wished to extend its operations outside of Quebec.

Objection was raised by some members to the fact that the word "Limited" was not being added to the name of the company, it being held that it was customary for commercial companies to do so. Hon. Dr. Reid, however, pointed out that the E. B. Eddy Company and the Grand Falls Water Power and Boom Companies had been incorporated without the word "Limited," and Mr. Claude Macdonell, acting chairman of the Private Bills Committee, clinched the argument by stating it would be very unfortunate if the bill were thrown out, because the president of the company, who had been before the committee, had stated he had an investment of \$5,000,000, and that for five months in the year operations were held up because of their not being able to make shipments after the close of navigation. The bill was finally allowed to go through.

The William Cauldwell Paper Company, Ltd., has also obtained authority at Ottawa during the past week to change its name to the Beveridge Paper Company, Ltd. A new company has been incorporated in the Chateaux Bay Pulp & Paper Company, Ltd., which will have its head office in Sherbrooke, Que., and will be capitalized at \$100,000.

The pulp and paper trade will await with interest the arrival in Canada on August 3 of the Dominions Royal Commission, the Imperial trade body which is touring the British Empire and which will go across Canada during August and September. Every branch of Canadian industry and commerce, including the pa-

per trade, will be investigated, and already much information from members of the trade has been secured by Mr. F. C. T. O'Hara, deputy minister of Trade and Commerce, who is the Canadian representative of the Commission. The Commission will visit Montreal, where three days will be spent, and will also hold sittings in all important Canadian cities. Among subjects of general interest with which it will deal, the most important will be that of ocean freight rates.

"The numerous and in some cases serious forest fires which occurred throughout Eastern Canada during May," are used by Mr. Clyde Leavitt, chief forester of the Commission of Conservation, to point the moral that Canadian forest fire protection is still inadequate. In an interview, Mr. Leavitt stated that, "These fires prove that, while much is being done by the various provincial governments and other agencies in forest fire protection, the provision is still inadequate in case of an extended drought. The strict enforcement of the permit system for the burning of settlers' slash would very materially reduce the number of fires. It is, however, hardly to be expected that, with the vast areas of forest lands and the relatively small population to bear the burden, adequate fire protection can be secured on cut-over forest lands so long as practically no requirements are imposed upon lumbermen as to the disposal of inflammable debris resulting from woods operations. The policy adopted by the British Columbia Government in this matter is the most progressive of any in Canada."

An accident which luckily was unattended with injury to any body occurred at the mills of the J. R. Booth Company at the Chaudiere early last Sunday morning when a whole section of the platform in front of the saw-mill collapsed and fell, carrying with it several rigs and small buildings. If the collapse had occurred on a week-day, some of the large number employed in the mills would probably have lost their lives, but fortunately no one was working in the vicinity.

BROWN WOOD PULP.

Among the new methods recently proposed for brown pulp without resorting to the grinding process, which requires great power, the roller crushing process of Rudolf Kron (Austrian Patent 54,166) deserves special mention. It is well known that the ordinary mechanical process with steamed wood consists in a combined grinding and crushing action entailing much loss of power by friction. It also makes too much waste in the shape of very small fragments.

The Kron process consists in passing the steamed wood between rollers lying across the grain, and it seems likely to replace the older methods as effectually as the roller has replaced the millstone in grinding corn. The rollers reduce the wood to fibres which have lost all their hardness and stiffness, so that they will make good pulp even out of the hardest woods.

The necessary succession of roller pairs is contained in a machine called the softener. The rollers are made of the best chilled cast iron, and the rollers of each pair are at adjustable distances from each other. The material is fed continuously to the uppermost pair, and leaves the lowest pair ready for the pug mill, whence it goes direct into stirring vats, and is then sorted and refined exactly like ordinary mechanical pulp, and passed to the draining machines.

The advantage of the new method as compared with the older processes are very great as much smaller power is required.—Zentralblatt.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine).

Mark S. Wilder, receiver for the Remington-Martin companies, who is now in full charge of the operating of the mills of the company, states that no definite plans have been mapped out as yet for the reorganization of the companies. Various suggestions as to the financing of the properties have been advanced but no decision has been reached. One of the plans now under consideration is to float a bond issue of a million and a half dollars. Of this issue \$1,074,000 is to be retained to take up other bonds of the companies, and \$100,000. was to be held in the treasury. It is said that since the company has been placed in the hands of the receiver officers of the companies have had their salaries greatly reduced. Judge Ray has again granted an extension of time to Mr. Wilder to manage the bankrupt paper companies for thirty days from June 8. This extension was granted because the receiver has been able to conduct the companies' affairs at a profit.

The annual meeting of St. Regis Paper Company was held in New York during the past fortnight, and quarterly dividend of $1\frac{1}{2}$ per cent. was declared. The dividend, which amounts to \$15,000, is payable on July 1. The following officers were chosen at the meeting: President, G. H. P. Gould; vice-president, Alva Miller; secretary and treasurer, George C. Sherman; general manager, D. M. Anderson. The following directors were elected: G. H. P. Gould, Alva Miller, George C. Sherman, D. M. Anderson, George W. Knowlton, J. Adolph Mollenhauer, P. D. Mollenhauer, J. Henry Dick and Jonathan Bulkley. The annual report, submitted and approved, showed a satisfactory financial condition, according to a statement by President G. H. P. Gould.

"The Log" has just made its appearance at Canton, N.C. It is published by the employees of the Champion Fibre Company, which supplies material to the Champion Coated Paper Company's plant in Hamilton, O., and follows the plan adopted in the Ohio city where "The Champion Spirit," a sprightly monthly paper, first made its appearance about five months ago. Both of these publications print news of direct interest to the thousands of employees and perform effective service in maintaining an interest in the mill activities. In their introductory, the editors of "The Log" declare that the name was selected on account of its peculiar significance.

The stockholders of the Granby Pulp and Paper Company, of Fulton, N.Y., have re-elected the following directors: D. A. Emerick, George P. Wells, C. R. Dines, Stanley B. Emerick and J. H. Howe. The directors in turn named the following officers: President, F. A. Emerick; vice-president, George P. Wells; secretary, S. R. Royce; treasurer, J. H. Howe. C. R. Dines was selected assistant manager.

The Savage Manufacturing Company this week filed a certificate of organization at Skowhegan, Me. The objects of the company are to manufacture pulp and paper. The company is doing a unique business, continuing the industry started by E. L. Savage, of mak-

ing paper for box linings, etc., from black stockings and newspapers. The stockings are used to give the various textures. It is said that this is the only firm manufacturing paper from these materials exclusively in the United States. About 26 hands are employed, and the demand is so great that Mr. Savage plans to increase the capacity of the plant. The company is capitalized at \$200,000, of which \$150,000 is common and \$50,000 preferred stock. Officers of the new company are James O. Savage, of Lawrence, Mass., president; E. L. Savage, of Skowhegan, treasurer; James O. Savage, Lawrence; Charles E. Savage, Groveton, N. H.; E. L. Savage, E. Bramhall, Minna B. Savage, Skowhegan, directors.

Geo. F. Baer, president of the Reading Paper Mills, of Reading, Pa., who died last month, left a personal estate of \$3,055,025. An inventory and appraisal was filed with the register's office at Reading on June 20. The appraisal follows: Deposit at Drexel & Co., Philadelphia, \$94,064; deposit at Schuylkill Valley Bank, Reading, \$3,245; proceeds from life insurance policies, \$58,476; farm stock, \$3,000; law books, \$1,600; office furniture, \$150; mortgage, \$8,000; notes, \$2,000; stocks, bonds and other interests, \$2,883,689. Total, \$3,055,025.

This appraisal does not include the real estate which comprised Hawthorne, the Baer residence in Reading, a farm in Bern Township, a \$60,000 residence at 1718 Spruce street, and other property. While it includes no real estate, it does include the Reading Paper Mills, a stock company, with three plants.

Niagara Falls, N. Y., was the scene on the night of June 22 of an interesting meeting of John P. Lundrigan, industrial agent of the International Paper Company; Jeremiah T. Carey, president of the International Brotherhood of Paper Makers, and John Mullin, president of the International Union of Pulp, Sulphite and Paper Mill Workers, and the employees of the Falls International plant. Several interesting addresses were delivered. Mr. Lundrigan spoke against the men voting in favor of a strike because all their demands in a new agreement presented to the company last June 1 were not granted, and Messrs. Carey and Mullin favored standing firm for the agreement. The men took a vote but President Brydges, of the Falls local, would not make it public until given out with the vote cast by all the 38 mills of the company. From speaking with a large number of the men it was learned to-day that the Falls employees do not favor going out on strike.

James Wright, for the past seven years assistant manager of the plant of the Consolidated Water Power and Paper Company at Grand Rapids, Mich., has resigned. He is understood to be in the East at the present time. It is said he has another position in view, but is not ready to make his plans known. Mr. Wright was formerly with the Neenah Paper Company, at Neenah, Wis.

The annual meeting of the Halifax Paper Corporation, of Roanok Rapids, N. C., was held on June 15 at Richmond when these officers were re-elected: Job Taylor, president and general manager; L. M. Williams, vice-president and treasurer; directors, Job Taylor, L. M. Williams, Winthrop Chanler, P. L. Ezekiel, Charles Calder, W. T. Reed, A. D. Williams, W. M. Habliston, and E. B. Addison. A very satisfactory report of earnings for the past year was submitted. The volume of business was about six times larger than the preceding period. The company manufactures a high-grade strongly sulphate kraft wrapping paper, and has its own chemical pulp mill, as well as paper mill.

Representing many millions of invested capital in one of the most important industries in America, five hundred paper manufacturers, jobbers and members of affiliated trades, assembled at the historic Butler county fair grounds, near Hamilton on Wednesday, June 17th, for the fifth annual mid-summer outing of the Miami Valley Paper Manufacturers' Association.

It was the most successful outing ever conducted by this popular and energetic organization, in point of attendance, and in all other respects it exceeded previous reunions. The first outing brought together 115, the second 225, the third 280, the fourth 325 and the final one approximately a half thousand.

The President of the Association, John J. Gibson, Jr., of the Wrenn Paper Company, Middletown, occupied the chair at the elaborate luncheon given, and Thomas Beckett, ex-president, J. F. Dunifur, W. W. Sunderland and the committee in charge of the outing, Chairman, Walter D. Randall, Hamilton; H. W. Nicholls, Lockland; Logan G. Thomson, Hamilton, and E. T. Gardner, Middletown, are to be congratulated on giving the Association one of the most enjoyable outings ever held in its history.

Interstate Commerce Commissioner Hall will sit at Boston, Mass., July 6 to hear evidence in the complaint of the New England Paper & Pulp Association against the Boston & Maine Railroad and others.

The Martin & William H. Nixon Paper Company is erecting a building in connection with its plant at Manassas, Pa., to be equipped with new machinery, for replacing a branch of its industry that has just been razed.

Work on the new building of the Dubuque Paper Company at Second and Iowa Streets, Dubuque, Ia., will be started in a few days, as the strike of the bricklayers at Chicago has been settled and the men will start to work on Thursday. The strike was declared two months ago, for not demanding an increase of wages. This was refused and the men walked out and as a result building operations all over the country were stopped as the contractors were unable to obtain brick, although there were millions of them stored in Chicago, but it was impossible to obtain men to handle them.

What will go down in history as the most disastrous conflagration since the burning of the Springfield Paper Mills occurred late Wednesday afternoon, June 3rd, when the building and valuable machinery and stock of the Tissue Company was completely swept away by the fire. Losses are estimated at \$200,000. The stock and machinery were valued at \$175,000 and the building

at \$75,000. The Tissue Company was organized about a year ago to manufacture crepe paper, paper napkins, table cloths, etc., and was located in the old Barclay Fibre Company plant which was rebuilt and new additions erected. The officers of the Tissue Company are Martin Cantine, president; Charles Coon, Jr., vice-president and general manager; B. F. Crump, treasurer, and James Dederick, secretary. The Directors are Benjamin Crump, Henry Diekhaut, Charles Mulford, Charles Coon, Jr., and James Dederick.

Peter G. Thomson, president of the Champion Coated Paper Company of Hamilton, Ohio, was acquitted June 4th, of a charge of bribery by a jury, in Justice Gould's Court, Washington, D. C., after fifteen minutes deliberation. The trial had been in progress for four weeks. The charge was brought against Mr. Thomson in May, 1910. The case had been set for trial five times and as often postponed. Thomson was charged by the Government with sending \$100 to Capt. W. P. Zantinger, a postoffice inspector, on duty at the Government Printing Office, who had to pass on the paper supplied by Thomson's concern. If E. Thomson claimed he had nothing to do with this branch of the business; that his son, Peter Thomson, Jr., was in charge of it, and that therefore the indictment should not hold against him.

D. J. Halsted of Paterson, N. J., has been appointed receiver of the American Paper Company, which operates two mills on River Road, Bogota, N. J. The appointment is the result, it is understood, of an application made by President A. S. Matheson, of Summit Avenue, Hackensack. The concern, of which Mayor W. N. Smith, of Bogota, is the vice-president, and general manager, was incorporated in 1904 under the New Jersey Laws with an authorized capital stock of \$400,000, of which about \$300,000 has been issued. President Matheson has always been the principal stockholder and controlled the company, and was looked upon as its financial backing. The company right up to date has always paid all obligations and the receivership is said to be the result of the company's inability to procure sufficient working capital. It is further said that the concern has been continually hampered for working capital from the start and have been obliged to extend their credit by giving notes for purchases of material and supplies. It is understood that the business will be continued as usual by the receiver. The officers of the American Paper Company are: President, A. S. Matheson, vice-president and general manager, W. N. Smith, treasurer, W. D. Matheson, general superintendent, C. P. Matheson.

The Court of Appeal in Albany, N. Y., has heard argument in the case of Edward N. Fournier, respondent, against the Union Bag & Paper Company, appellant. The appeal is from the affirmation of a jury verdict of the Saratoga trial term of \$5,500, in favor of plaintiff in an action to recover damages for personal injuries suffered by plaintiff September 23, 1910, when employed in defendant's paper mill in Ballston. The labor law was alleged to have been violated because the machinery was not guarded properly and a safe place provided in which to work. Fournier's left hand was crushed between revolving rolls when feeding paper into them. The defence was contributory negligence.

A contract for the manufacturing of 1,000,000 paper boxes for the largest system of five and ten cent stores in the world has just been closed by the Oklahoma Paper Company, at Oklahoma City, Okla. The boxes will be made for the Woolworth Company of New York and will be distributed from eighty-six of the big stores operated by that firm. Under the contract the company will receive \$20,000 for making the boxes, which are to be delivered for the Christmas holiday trade. Ben Hirschland, head of the Oklahoma Paper Company, says that the boxes will be chiefly distributed in the Western division of the territory occupied by the Woolworth Company, the eastern limits being Cincinnati, O.

To a petition asking for appointment of a permanent receiver for the Thames River Specialties Company, manufacturers of cardboard and paper in Montville, Conn., filed last week, an amendment was added on June 18, alleging that the business of the company has been conducted in violation of the Sherman anti-trust law, and contrary to the laws of Connecticut. Mary Deford Bigelow, holder of 326 bonds, and other bondholders, are the petitioners. In the amendment it is claimed that a majority of the directors of the company are engaged in an unlawful and fraudulent conspiracy and combination, the object and purpose of which is to control the output of cardboard and paper of various kinds in the trade, and to control the sale of paper and cardboard between the various states; to advance and control the prices of said paper and by preventing competition in them; that a majority of the directors are now in control and management of other concerns engaged in the manufacture and sale of cardboard and paper, and which should be competitors of the Thames River Specialties Company, and in competition one with another, and that said directors by means of combination and unlawful conspiracy intend to control and advance prices and to lower the quality of paper and cardboard. Maunsell Van Rensselaer, the president, is temporary receiver of the company.

General Appraiser Somerville, sitting before the Board of United States General Appraisers in New York last week handed down his decision in the case of Chatfield & Woods Co., Cincinnati, Ohio, et al. protests (676,790 etc.) on wrapping paper. The shipment came from Sweden and was held entitled to free entry. The ruling in the case of the American Express Co. vs. United States (Canadian Reciprocity Act) 4 et. Customs Court Appeals, 146, T. D. 33,134, was followed in admitting the merchandise into this country.

The mill of the Forest Paper Co. at Yarmouth, Me., which has been closed down for a number of weeks to give an opportunity to reduce the stock on hand, has resumed operations again, and machines are running smoothly. Officials of the company expect to run the mill on full time for the rest of the year.

The Haverhill Box Board Company of Haverhill, Mass., filed a brief on June 17 with the Interstate Commerce Commission, asking that the Boston & Maine R. R. be required to carry paper box board and paper stock board at the sixth class rate, the same as friction board and cardboard.

William R. Janeway, president of Janeway & Co., noted as the oldest wall paper concern in the United States, announced on June 20 that his concern at New

Brunswick, N. J., would retire from the industry when contracts now in force have expired. Some will expire next month, and all will be finished soon.

"Foolish legislation," business uncertainty, and the resultant hazards and expenses of business were reasons Mr. Janeway gave for his decision to close his factory, which has prospered since it was founded, in 1844, until recently. During the last few weeks the force that at times consisted of 200 skilled workers, many of whom grew up with the firm, has dwindled to about 150. Mr. Janeway expressed himself as dissatisfied with, but not pessimistic, about trade conditions in general. "One man will tell you," he said, "that conditions will soon be flourishing, and another will say the land is going to the demitition bowwows. I will say that conditions are not satisfactory, but there is no danger at all of the United States going to the demitition bowwows. Neither is there any danger of New Brunswick permanently losing this industry. I can assure you I will find a buyer for the factory." The firm of Janeway & Co. weathered every panic or period of business depression in the seventy years of its life. On Feb. 4, 1884, two Pennsylvania oil trains collided, and the factory, which is near the railroad, caught fire and was destroyed. The result of this was that the business was soon lodged in other quarters.

After a month of illness the Continental Paper Bag company has opened its plant again at Watertown. The mill has been closed for repairs, and sufficient work has been finished to permit operations. All of the repairs, however, will not be completed for at least two months yet. The machines have been put in shape so that paper-making might be gotten under way and the plant is now running comparatively smoothly. Three accidents during the few weeks preceding the closing of the shop caused the shut down. The plant was first held up owing to the breaking down of an engine. A few days later several freight cars were dropped down a siding into one of the walls, badly smashing one wing of the building. Fire broke out in the plant a day or two afterward, causing several thousand dollars' damage.

Advices from Fulton, N. Y., state that the Oswego Falls Pulp and Paper Company has won its suit against the State of New York for damages to its plant by the barge canal work, inasmuch as the absolute water property rights of the company are secured, although the money consideration was nominal. It will be necessary for the company to rebuild the power plant, similar to the one now under construction by the American Wooden Mills Company, and at a cost of about \$200,000. But the raising of the upper dam has greatly increased the water power, which especially in low water time will be of great benefit.

The net profits of the United Paper Board Company, of New York City, for the eleven months of its operation were \$206,970 or nearly double the profits of its predecessor, the United Box Board Company, for the corresponding period of the previous year. The company's earnings were at the rate of 10.75 per cent. per annum on its \$2,100,000 preferred stock. While the gross sales for the eleven months ended April 26 were smaller than for the corresponding period a year previous by \$118,270, net earnings were larger by \$72,806, showing the good results of the economies effected in production.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE



Paper made by union labor and bearing the label of the British trade unions of paper workers is now on sale in London and Manchester, and judging by the way things are going at present the unions are leaving no stone unturned to force manufacturers of paper to adopt the label. To fulfil this object a great conference will take place of paper workers from various countries, either in London or Berlin, within the next three months and some definite arrangements will then be come to with a view to forming a basis to compel all paper mills in paper producing countries to take up the label and place it on their products, thus showing that trade union hands were engaged in the output. The arrangements for this conference are not yet completed, but some announcement will be made in the near future on the matter.

A very interesting little ceremony took place the other day at the mill of Messrs. C. Davidson & Sons, Ltd., Mugiemoss, when Mr. Alexander Horne was made the recipient of a handsome presentation on leaving for Holyoke, in the States, where he is going to take up an important position in one of the paper mills there. It is not often Americans send to England for a paper worker, but Mr. Horne is a good man in the finishing department of a mill, and for 33 years he has worked with Messrs. Davidson & Sons, Ltd.

The Hele Paper Company is one of the best known British firms in the paper industry, and the company has also a reputation for having some of the oldest papermakers in the United Kingdom, if not in the world. There is quite a little band of them in the mill and the other day one of the retired foremen who now acts as time-keeper at the mill—celebrated his 60th year as an employee. At eleven years' of age this old employe entered the mill—that was in 1854—and there he has remained ever since a faithful and trusted servant. To celebrate the event the president of the mill handed the old veteran a magnificent clock, on which was engraved an appropriate inscription. How many paper mill workers can boast of a record like this with one firm?

Notwithstanding the dullness that prevails in the British paper industry, it is reported by Wm. Dyson, secretary to the Amalgamated Society of Paper Makers, that a large contract for newsprint has been given by a large consumer in England to a Norwegian mill, and the price is two cents per pound, less a small percentage off. The contract extends to 1918 and Mr. Dyson says that the price and the placing of the contract outside British circles, creates a new difficulty for the British manufacturer, who is experiencing much trouble in not only trying to secure orders to keep machinery running, but in trying to get a reasonable price to cover the increased cost of production experienced lately.

Writing of Norway recalls the critical condition in which Norwegian pulp mills are in at the present moment. Some are dropping out of the paper trade and others are being converted into paper mills. At all events Norway is in a distressing state. At Drammen the Elver mill has been destroyed by fire and the Eng-

nes mill has stopped altogether. The Meraker mill has also been destroyed by fire and a rumor is current that it is not to be rebuilt, the power being turned to other use. Other mills on the Drammen river, owing to the dullness of the paper trade in general, have reduced their output whilst others have shut down their machinery until trade revives. At Fredrikshald one mill is closed until better prices can be realized for its products, whilst the owners of another pulp mill have decided to leave the pulp trade and build a paper mill. In Fraelandsfos a fire has partly destroyed a large mill and affected the output, of course. A reduction in the output, curiously enough, has not the slightest effect on the present low prices.

The British paper industry has not yet reached its normal position. Since the beginning of the year trade has been very dull and naturally the pulp trade is interfered with. During May the export trade of the British mills decreased considerably, according to the Trade Board returns, and the imports also show a decline, which means that more than the British mill owners are suffering from depression.

The following are the figures for May:—

	cwts.	£	cwts.	£
	1913	1913	1914	1914.
Imports	1,046,518	624,356	1,018,584	620,739
Exports	298,648	324,759	270,253	278,969

These figures include writing and printing paper, packings and wrappings, paper hangings, printed and coated paper, boards, playing cards, envelopes and bags. From Newfoundland 29,588 cwts. of printing paper on reels was imported in May, compared with 51,400 cwts. in May 1913, whilst for the five months since January the total is 134,123 cwts., as against 125,348 cwts. for the same period last year. Norway and Sweden are the largest suppliers of reel paper to the British markets and for paper not on reels Norway and Germany have the lead. Germany also supplies most of the paper hangings as well as the coated papers. In the imports Canada is not given in the list owing to the supplies from the Dominion being small. The British export trade includes 202 cwts. of writing paper to Canada (United States 367 cwts.) compared with 218 cwts. in May last year (United States 215 cwts.) and 13,656 cwts. of printing paper—mostly high grade papers—compared with 13,262 cwts. in May 1913. The States took 1,800 cwts., as against 3,035 cwts. The total export trade for the five months is:—writing paper to Canada 1,676 cwts., as against 2,716 cwts.; printing paper 38,704 cwts., as against 57,548 in May last year. The total trade of the British industry from January to May is now as follows:—

	1913	1913	1914	1914
	cwts.	£	cwts.	£
Imports	5,164,064	3,065,807	5,024,226	3,072,848
Exports ...	1,498,582	1,594,787	1,422,481	1,467,831

As already mentioned the dullness in the paper industry has affected the importation of wood pulps. The Trade Board figures for May are as follows:—

	1913 Tons	1913 £	1914 Tons	1914 £
Chemical	49,500	395,600	40,114	317,690
Mechanical	50,088	120,688	44,362	99,343

The figures for the five months ending May are:—Chemical 123,527 tons, as against 133,685 tons; mechanical 179,863 tons, as against 207,021 in May 1913. Norway was the largest supplier of bleached chemical (dry) in May, Sweden the largest supplier of unbleached (dry), with Norway next and Norway the biggest supplier of mechanical. From Canada 4,732 tons of wet mechanical was received in May, compared with 17,353 tons for the same period last year. The total for the five months is 13,934 tons, as against 19,923 tons for the five months, January to May in 1913. No sulphite or sulphate has been received from the Dominion, but in June a small cargo of sulphite has arrived.

A. E. Reed & Co., Ltd., held their annual meeting in London on the 11th May and from the company's report furnished your correspondent the company is paying a dividend of 10 per cent. and the net balance available for disposal was £97,096 13s. Mr. A. E. Reed, president, said the profits were some £3,000 less than the previous year, but that amount was more than covered by the loss occasioned by a fire which occurred at the Maidstone mill. He explained that the new building erected was practically fireproof, that four machines were to be erected—two were now working, one was just delivered at the mill and by the time the third machine was in working order the mill would be restored once more to its normal production and the company hoped to have some benefits arising in the future. They proposed to add £5,000 to reserve this year as usual, and £25,000 to a special reserve fund to guard against contingencies. That, of course, strengthened the position of the company. Out of the whole of the production of their mills a very large percentage went to the daily, weekly and monthly publications in London and elsewhere, and that went on from year to year. Indeed, a great many of the publications they had supplied for over 10 years.

Other firms who have declared dividends are: North Cornwall China Clay Co., Ltd., 7 per cent. on all shares, the president remarking that they had one of the finest clay sets in the world; William Tod, Junior, & Co., Ltd., 5 per cent. on the preference and 3 per cent. on the ordinary shares; Spicer Bros., Ltd., papermakers, 5 per cent. on preference shares, 7½ interim dividend of 2 per cent. Two hundred and fifty shares of £10 each (fully paid) in the paper mill of Guthrie, Craig, Peter & Co., of Brechin, were sold the other day, 15 realizing £9 2s 6d., 25 £8 17s. 6d. and 75 £8 10s. each.

The Associated Newspapers of London, a company that owns a large share in the Anglo-Newfoundland Development Co., have made a profit of £165,564, and they are paying a dividend at the rate of 10 per cent. The report of the company added: "The annual balance sheet of the Anglo-Newfoundland Development Co., Ltd., showed a profit of £65,054 for the year ended August 31st last, compared with £51,233 in 1912, and although no dividend was declared the directors' report showed that the company was making very satisfactory progress and that improved results might be expected in the future. The output of the mill is increasing and the quality of the paper and pulp produced by the company continues to be highly satisfactory."

The Canadian Board and Paper Company, the agents for the Laurentide Co., Ltd., J. R. Booth, McLeod Pulp Co., Ltd., and the Brompton Pulp and Paper Co., Ltd., have removed their offices in London from 69 Fleet St., to Windsor House, Kingsway, W.C. Kingsway, by the way, is one of the finest thoroughfares in London, and most of the progressive firms are taking up their abode in it, if they can obtain the room.

The British Consul at Dresden reports that the German paper trade, particularly those engaged in the production of packing and wrapping papers, has felt the depression in trade, and the demand has fallen 50 per cent., whilst raw materials are costing 10 per cent. more. Nevertheless wages advanced owing to a tariff condition that prevails.

The British Paper Makers' Association are going to establish a southern federation in England. They already have one in the north of England. This new move is partly on account of the recent growth of the Workers' Unions in the south, because it will leave the employers federated, and place them in a position to go as a body and meet the unions, which usually negotiate during times of a dispute, as a body, also. These federations are excellent things, because they bring employers and employees together in a bartering mood, with the result that many grievances are rectified and much unpleasantness removed.

FOREST FIRE PROTECTION STILL INADEQUATE.

The numerous and, in some cases, serious forest fires, which occurred throughout eastern Canada in May, prove that, while much is being done by the various provincial governments and other agencies, in forest fire protection, the provision is still inadequate in case of an extended drought. The strict enforcement of the permit system for the burning of settlers' slash would very materially reduce the number of fires. It is, however, hardly to be expected that, with the vast areas of forest lands, and the relatively small population to bear the burden, adequate fire protection can be secured on cut-over forest lands so long as practically no requirements are imposed upon lumbermen as to the disposal of inflammable debris is resulting from woods operations. The policy adopted by the British Columbia government in this matter is the most progressive of any in Canada.

PAPER-MAKING INDUSTRY IN SOUTH AFRICA.

The British Trade Commissioner for South Africa (Sir R. Sothorn Holland) reports that, according to information received from the Commissioner of Customs and Excise at Pretoria, the Chairman of the Industries Committee of the Pretoria Civic Association states that bales of ordinary veldt grass were sent to Scotland and America for experimental purposes, and reports from Scotland indicate that this grass is nearly equal to esparto for paper-making purposes. It is stated that a capital of £20,000 would be sufficient to run a mill capable of producing a minimum of 15 tons of packing and coarser kinds of paper per week. In advocating the starting of a paper factory at Pretoria, the chairman points out that in addition to the grass, two of the principal articles necessary for the manufacture of paper, viz., lime and coal, are available in large quantities at a cheap rate.



NEW PATENTS



PULP BEATING AND WASHING MACHINES

By W. A. NEWTON, of Toronto, Ont., Patentee.

Canadian Patent No. 154,511.

This invention relates to improvements in Pulp Beating and Washing Machines used in paper manufacture, and the object of the invention is to produce a machine whereby the beating and washing of the pulp will be accomplished with less power and in a more

extending over the pan and consisting of longitudinal and transverse members, the bottom transverse members being adjustable, beater rolls mounted on the adjustable transverse members, knife plates suitably hung from the platform, suitably supported rotatable drum washer extending into the pan intermediately between the beating rolls and suitable means for rotating the tub, beater rolls and washing drums, the parts being arranged and constructed in detail, as shown in the accompanying drawings.

There have probably been more patents taken out on beating and washing engines than any other piece of paper mill machinery, and still the Hollander Type has lived through, and to-day is the standard beater.

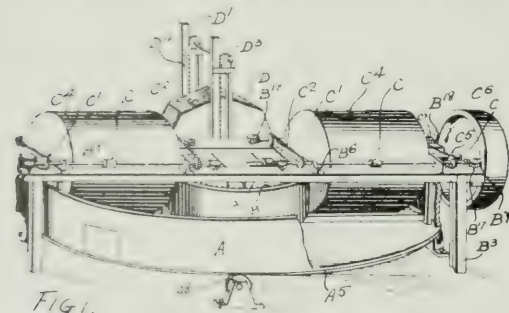


FIG. 1.

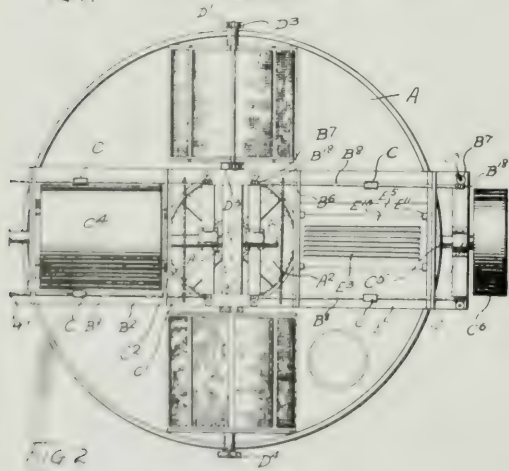


FIG. 2.

efficient manner. The invention consists essentially in the use of a rotatable tub having inner and outer annular walls, the bottom section of the tub being substantially rectangular in form, T-shaped rails on the under face of the tub bottom, and parallel with the outer and inner periphery of the tub, a standard post bearing a bottom support, a bearing fitting the upper end of the post and having radial arms secured to the inner face of the inner tub wall, so that the tub is held in rotation in the post, fixed brackets carrying rollers which engage with the T-shaped rails to support the tub on independently supported frame

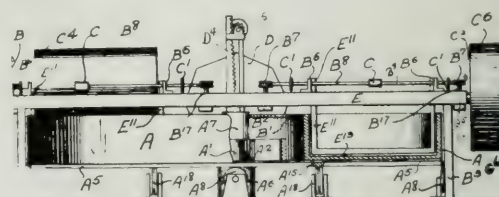


FIG. 3.

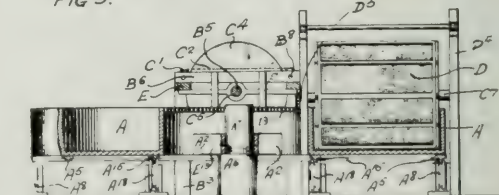


FIG. 4.

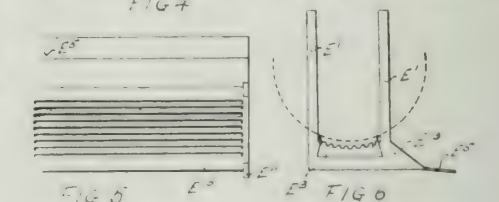


FIG. 5.

In nearly every case, however, the patents have been on some method of improving the circulation of the stock, or decreasing the power necessarily consumed in raising the stock over the back fall, so that it will flow around to the front of the roll. To replace the back fall, we find patent covering paddle wheels, screw conveyors, pumps, etc., the reason being that the beater roll and back fall act very inefficiently as a pump, and any other means of lifting the stock more efficiently results in a saving of power, and since from forty per cent. to seventy per cent. of the total power consumed by the Hollander is used in raising the stock over the back fall, any improvement in efficiency results in considerable saving.

It is plan to be seen that if circulation from the back of the roll around to the front is accomplished without

lifting the stock over the back fall so that it will flow around by gravity, the majority of the total power required by the beater would be eliminated, provided the new means of circulation did not consume this power.

This is what has been accomplished by this invention, the back fall has been eliminated and not only will the power be reduced, but it also has the following additional advantages:

The circulation is positive and the stock close to the walls of the tub passes between the roll of bed-plate as often as the stock laying farther away from the walls, which is not true of any other beater. The stock may have as high a consistency as is desired without interfering with the circulation, which is not possible with any other beater. Five per cent. of stock to ninety-five per cent. of water being common practice. Construction of the roll need not be as complicated, since it does not act as a pump, and the beater is therefore adaptable to any combination of stone or steel rolls, stone or steel bed-plates, washing drums, etc. The mechanical construction of the various parts will vary more or less, depending on the capacity.

Claims

1. In a pulp beating machine, the combination with the revolving beater drum, of a pan, and means for revolving the pan so as to feed the paper stock to and from the drums, as and for the purpose specified.

2. In a pulp beating machine, the combination with an annular pan, means for rotatably supporting the pan, and means for rotating the pan, of a stationary frame extending over the pan, means for independently supporting the same, beater drums carried by the frame and co-acting knives and carriers therefor supported by the frame beneath the drum, so and for the purpose specified.

3. In a pulp beating machine, the combination with an annular pan, means for rotatably supporting the pan, and means for rotating the same, of a stationary frame extending over the pan, means for independently supporting the same, beater drums carried by the frame and co-acting knives and carriers therefor supported by the frame beneath the drums, and means for adjusting the drums to take up the peripheral wear thereon, as and for the purpose specified.

4. In a pulp beating and washing machine, the combination with the annular rotating pan and an annular horizontal gear carried thereby, of suitably journaled washer drum shafts arranged radially of the pan, a gear mounted on each shaft and engaging the annular gear of the pan, and washer drums mounted on the shafts, as and for the purpose specified.

5. In a pulp beating machine, the combination with a suitably supported revolving pan, of an independently supported frame comprising longitudinal and cross connecting members, movable cross members, means for vertically adjusting the movable cross members in relation to the frame, beater drum shafts journaled thereon, beater drums mounted on the shafts and co-acting knives and knife frames carried by the said frame, as and for the purpose specified.

6. In a pulp beating machine, the combination with a suitably supported revolving pan, of an independently supported frame comprising longitudinal and cross connecting members, movable cross members, a threaded spindle extending throughout the movable members and bearing on the cross members of the frame, and means for simultaneously turning such threaded spindles, as and for the purpose specified.

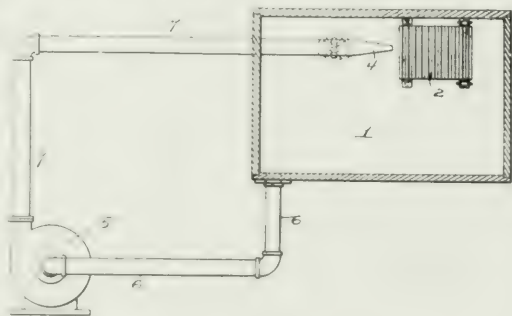
William H. Stobie, of Waterville, Maine, has taken out patents in the United States on four inventions relating to the pulp industry. They are:

Process of Disintegrating Fibrous Material Used in the Manufacture of Paper-Pulp. No. 1,099,578.

My invention relates to an improvement in the process of disintegrating fibrous material used in the manufacture of paper pulp, the object being to divide or separate the fibres without breaking or cutting them, thereby producing a stock that will felt better than the stock from an ordinary beating engine, and my invention consists in mixing the fibrous material with water and projecting it in the form of a jet, against a roughened or serrated surface.

My invention further consists in drawing the stock from a vat, by means of a pump and projecting it in the form of a jet against a roughened surface located within the vat, and continuing the operation until the fibres have been thoroughly separated from each other, change its position relative to the discharge nozzle 4.

Leading from the bottom of tank 1 to the pump 5 the pipe 6, and leading from the pump 5 back to the tank 1, is the discharge pipe 7, terminating within the tank in the nozzle 4, the discharge end of which may be circular or oblong. The nozzle is so located with



relation to the serrated plate 2 that the stock will be projected against the serrations at an angle or with a glancing blow, and is kept circulating through the tank, pump and pipes against the serrated plate, until the stock has been reduced to the required consistency. This contact of the stock with the roughened face of the plate reduces the material to fibrous form without impairing the strength, or reducing in length, the fibers of the original pulp.

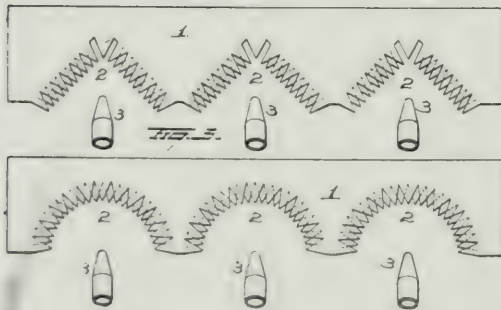
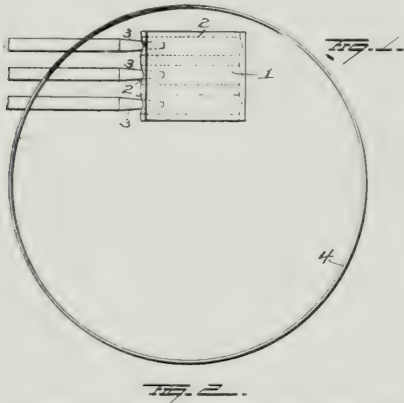
The target 2 is unconfined, that is to say, it is not provided with marginal flanges or walls and is so located with relation to the walls of its inclosure that the liquid pulp after its contact with the target, will be unrestrained and free to fly out of the path of the incoming stream, and the target is of such size in proportion to the stream, that ample room is provided for the spreading of the stream or jet after it strikes the target.

Again instead of circulating or repassing the stock through the vat and pump until it has been reduced to the desired condition, I may simply as one step in the process, project the stock against the serrated plate, and then pass it to a refining engine or other apparatus employed in the paper making process. The action of the serrated face, on the stock, is to divide

or separate the fibres without breaking or cutting them and experiments have demonstrated that stock can be prepared, by this process, for the paper machines without any treatment whatsoever in the old style of

The accompanying drawing is a diagrammatic view of one form of apparatus for carrying out my process.

1 represents a vat or tank to contain the paper stock which has been previously mixed with the proper proportion of water to reduce it to a consistency where it can be readily pumped and conveyed through pipes, and 2 is a plate or target within the tank and provided with a serrated surface. This plate is preferably made of metal, but it may be of sand stone or other material and may be an integral structure or made up of sections, and it may also be fixed, or adjustable so as to beaters.



Apparatus for Disintegrating Pulp. No. 1,009,579.

This invention relates to an improvement in apparatus for disintegrating pulp, the object being to provide improved means for dividing or separating the fibres of the stock, without breaking or cutting them into short lengths, thereby producing a stock that will felt better and more uniformly than the stock from an ordinary beating engine, and my invention consists in a target having a groove or gutter and a nozzle discharging the pulp into said gutter in the direction of the length of the latter, the face of the gutter being serrated or roughened.

My invention further consists in providing a rectangular target or slab with a series of gutters, and a discharge nozzle for each gutter, each nozzle discharging in the general direction of the length of the gutter.

My invention further consists in certain details of construction and combinations of parts as will be more fully explained and pointed out in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic view in plan of my improvement. Fig. 2 is a view in end elevation of the target, and the nozzles in their proper relative positions, and Fig. 3 is a similar view of a modified form.

1 represents a target preferably made of metal, but which may be made of stone, emery or other suitable material. This target is preferably rectangular in shape and is provided with a plurality of grooves or gutters, 2, V-shape in cross section and extending in the direction of the length of the target. Each target may, however, have only one gutter. The surfaces of the gutters are serrated or toothed as shown in Figs. 2 and 3, and the nozzles 3 are located so as to discharge the pulp against the target in the direction of the length of the gutter. The nozzles are located with their long axis approximately in line with the center of the gutters, as shown in Fig. 1, and preferably tangentially thereto as shown in Figs. 1 and 2 so as to strike the target a glancing blow, thus causing the pulp to spread out and make repeated contacts with the serrations before it leaves the target. The gutters are located, preferably on the inner or lower face of the target, and the targets are preferably slightly inclined downwardly, so that the pulp stream from the nozzles, which are located horizontally below the targets as in Fig. 1, will be deflected into the vat or tank 4, thus preventing any upward splashing of the pulp. This pulp may be carried by means of a pump and pipes from the tank 4 to the nozzles, continuously until the pulp has been properly disintegrated, and the target may be adjustable longitudinally so as to present a new working surface to the action of the pulp streams, whereby the whole serrated surface of the gutters may be used up before removing the target for redressing or replacement.

The target is preferably located in the vat containing the paper stock which has previously been mixed with a proper proportion of water to reduce it to a consistency where it can be readily pumped and conveyed through pipes to the nozzles 3, which are so located as to forcibly discharge the streams against the serrated faces of the gutters and tangentially thereto. With the targets located in the vats, the stock falls back into the vat and will be carried around and again forcibly projected against the targets until it is in proper condition for felting. The targets may, however, be located outside of the vats, so that the stock after one contact with the target, may be collected and carried off for the next step in the process.

In the construction shown in Fig. 3, the gutters are preferably semi-circular in cross section, instead of being V-shape with flat surfaces as in Fig. 2. The action of the serrated or toothed faces on the stock is to divide or separate the fibres without breaking or cutting them or reducing their lengths, and the object in providing the targets with elongated gutters and forcibly ejecting the stock into the gutters in the direction of the length of the latter and tangentially thereto, is to more closely confine the stock and cause it to make repeated contacts with the serrations before it falls back into the vat.

Apparatus for Disintegrating Pulp. No. 1,099,580.

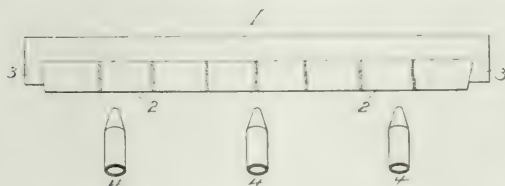
This invention relates to improvements in apparatus for disintegrating pulp, and more particularly to the targets constituting a part of said apparatus.

The object of the invention is to simplify and cheapen the cost of construction of the targets, and it consists in the details of construction as will be more fully described and pointed out in the claims.

The accompanying drawing is a view in section of the target showing the pulp discharge nozzles through which the pulp is projected against the target.

In apparatus wherein these targets are used, the paper stock which has previously been mixed with a proper proportion of water to reduce it to a consistency where it can be readily pumped and conveyed through pipes to the nozzles, is pumped and forcibly ejected through nozzles against a target having a serrated or roughened face for the purpose of disintegrating the fibre and putting it in proper condition for effective felting. These targets have heretofore been made of metal, and also of stone, and when made of stone have been in one integral piece.

My present invention is designed to simplify and cheapen the cost of production and repair of the targets, and it consists of a metal frame 1, either square, rectangular or circular into which blocks 2 of sandstone, basalt, carborundum or any other suitable stone or material are placed and secured by cement or otherwise. The frame 1 is provided at its outer edge or periphery with a flange 3 which latter is undercut as shown, and the end blocks at the sides, or periphery as the case may be, are correspondingly beveled to take



under the flanges 3. The blocks may be of any size but are preferably so shaped at their edges to make close joints with the adjacent blocks and they are all secured together by cement or any other suitable binder. The natural surfaces of unsmoothed blocks may be used, but the best results are obtained by having the surfaces roughened by grooves more or less pronounced according to the stock used and results desired. The target so constructed is employed in connection with a plurality of nozzles 4 which latter discharge the stock upwardly at an incline against the roughened faces of the blocks, the contact of the stock with the stone slab operating to separate and disintegrate the fibres without cutting or shortening them.

If desired the target may be set at a slight inclination and the nozzles be horizontal and so placed with relation to the target that the pulp will strike the latter tangentially, and, under its impetus from the nozzle, move in contact with the target for some little distance before falling back into the vat in which the target is usually located. Again the target is of such size that it can be moved sidewise to present new working surfaces to the pulp streams, thereby permitting the whole surface of the target to be used up before removing it for renewal or repairs.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and

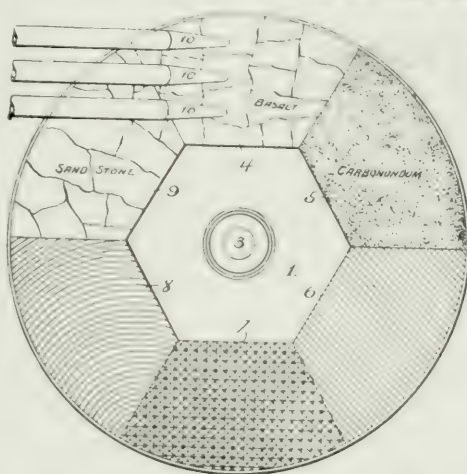
scope of my invention. Hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts shown and described.

Apparatus for Disintegrating Fibrous Material. No. 1,099,581.

This invention relates to an improvement in apparatus for disintegrating fibrous material used in the manufacture of paper pulp, the object being to provide a target against which the stock is forcibly projected, with a plurality of surfaces of different milling capacity, the target being adjustable whereby any one of said surfaces may be readily moved to a position to receive the discharge from a stock projecting nozzle.

With this object in view my invention consists in the parts and combination of parts and in the details of construction as will be more fully described and pointed out in the claims.

The accompanying drawing is a view in elevation of my improved target, also showing the nozzles through which the stock is projected against the target. Paper stock intended for very thin paper must



be treated differently from that intended for heavy paper. It is also desirable to change the targets, where a change in the grade of material is necessary, and again it may be desirable in order to shorten the process, to work the stock against one surface, say a plate having sharp pyramidal projections which will quickly separate and divide the fibers, and conclude the operation with a plate having a less roughened surface, as for instance sandstone or carborundum.

My present invention provides a target having a series of surfaces of different milling or disintegrating capacity, and it consists of a disk 1 provided with a peripheral flange 2, the disk being centrally secured to a shaft 3, by which it may be turned to present any one of the several disintegrating surfaces 4, 5, 6, 7, 8 and 9 to the pulp or stock streams which are forcibly ejected from the nozzles 10.

The disk 1, in the present instance carries the cutting blocks or surfaces, on one of its faces only, but it may have them on both faces, in which event a second set of nozzles would be located to project the stock against the opposite face. Again the disk may be horizontal with the nozzle above or below same, or ver-

tical with the nozzles at the side. The nozzles 10 are located at an inclination to the working face of the disk so that the stock will be projected tangentially against the milling surfaces of the several working sections of the disk.

The working sections may be composed of basalt or lava stone, one of carborundum; one of sandstone and several of metal or stone having serrated faces. In one, the serrations or ridges are shown extending in straight lines transversely across the section in another the serrations are curved and in another the face of the plate is made up of a series of small pyramids. If stone or composition sections such as sand stone, basalt or carborundum be used, the surfaces may be either grooved or serrated, or left in their natural rough condition. The material used for the working section and the method employed for producing the roughened or serrated faces is unimportant, as the principal object is to provide the disk with a series of working surfaces so as to provide for varying cutting or disintegrating capacity.

By first projecting the stock against a serrated plate the stock will be quickly disintegrated and by finishing up with a sandstone, lava or carborundum surface the stock will be more finely divided and the fibers as perfectly separated as they can be in the ordinary beater engines and in much less time and at but a

fraction of the cost.

The nozzles 10 are connected to pipes leading to a pump which draws the stock from a vat in which the target is located. The nozzles are so located with relation to the disk that the stock will be projected against the roughened surfaces tangentially and then fall back into the tank, and is kept circulating through the tank, pump, and pipes against the target until it has been reduced to the desired degree of fineness. This contact of the stock with the roughened surfaces separates or pulls the fibers apart without seriously impairing the strength or reducing the length of the original fibers.

Instead of circulating or repassing the stock through the vat, pump and nozzles until it has been reduced to the desired degree of fineness, it may after one contact with the target be passed on to a reducing engine or other apparatus employed in the paper making process.

The action of the roughened faces on the stock is to divide or separate the fibers without shortening them and this is what is meant by the term milling used in the specification and claims and actual use of the apparatus has proved beyond question, that stock can be prepared, by this apparatus for the paper making machines without any treatment whatsoever in the old style of beaters.

PULP AND PAPER NEWS

(Special to Pulp and Paper Magazine.)

The F. N. Burt Co., Toronto, have declared their regular quarterly dividend of one and three-quarter per cent. on the preferred stock of the company and one and one-half per cent. on the common stock. The Pacific Burt Co., Toronto, have also declared their regular one and three-quarter per cent. on preference and regular half yearly one per cent. on common. The Toronto Paper Manufacturing Co., whose plant is located at Cornwall, passed their regular quarterly dividend of one and one-half per cent. on the stock for the present quarter. This has been thought best in the present interests of the company in view of the quiet state of the market, and to strengthen the reserves.

A representative delegation of the Rochester Chamber of Commerce recently spent several hours in Toronto and were entertained to an automobile drive and afterwards to dinner at a banquet. W. P. Gundy, who is Vice-President and Managing Director of the Kinleith Paper Mill, and W. J. Gage Co., President. Mr. Gundy is also President of the Toronto Board of Trade.

At the annual meeting of the Standard Chemical, Iron and Lumber Co., held in Toronto last week, the annual report showed that the floating liabilities had been reduced from \$1,990,000 on December 31, 1913, to \$650,000 on May 1 of the present year. Further substantial reductions are being made and the business of the company is reported to be in a sound condition while the general situation is improving gradually. L. M. Wood was re-elected President, N. L. Davies, Vice-Pres., and A. G. Gage, General Manager.

F. H. Gage of Toronto, for several years sales manager of the Kinleith Paper Co., Limited, whose mills are at St. Catharines, Ont., has resigned and leaves on July 7 for an extended trip to Great Britain and the Continent, where he will join his wife and family. He has been succeeded by Lawrence A. Dance, for some time with W. J. Gage Co., Toronto. Mr. Gage has been connected with the paper trade for over twenty-two years and on his return home will devote himself to representing several special lines.

The Kinleith Paper Mills of St. Catharines, Ont., which recently laid new concrete floors in the beater room and installed new beater tubs, have completed the work. The second machine of the company was started up again this week.

The many friends of Sir Adam Beek, who is widely known in connection with his splendid work in the hydro-electric interests of Ontario, now supplying over seventy thousand customers, and whose business enterprises as a box manufacturer are located in several cities of the province, will congratulate him on being one of the recipients of King's Birthday honors.

H. M. Thorne, Secretary Treasurer of the Canada Paper Co., Montreal, has returned from spending a pleasant holiday at Lake Placid in the Adirondack Mountains.

A serious fire visited Grimsby, Ont., on June 17, when the plant of the Consumers Lumber and Box Co. was destroyed by fire, damage being done to the extent of \$25,000, including \$7,000 on new machinery just installed. The insurance amounted to only \$25,000.

D. J. Albertson of Kalamazoo, Mich., the widely-known paper mill engineer, was in Winnipeg, recently conferring with L. N. Austin of the Austin Paper Co., in regard to an extension of the plans which the latter prepared some time ago for the erection of a new mill which will convert flax straw into paper. It is understood that the project will soon be rushed ahead to completion.

A. A. Wheat, who is a director of the St. Lawrence Paper Mills, Toronto, and for some years has been superintendent of the Kalamazoo Paper Co., Kalamazoo, Mich., has been appointed superintendent of the Elkhart Paper Co., of Elkhart, Ind. He has been Vice-Pres. and a member of the board of the latter concern for a couple of years.

The annual meeting of the Wayagamack Pulp and Paper Co., will be held at the offices of the company at Three Rivers on July 16. At the last meeting of the Board a resolution of condolence was passed in connection with the death of James Reid Wilson, and a copy ordered to be sent to Mrs. Wilson and family. Expression was given to the keen sense of personal loss in the removal of one whose advice and good judgment, together with his unbounded faith in and financial support to their enterprises, had proved a source of much strength to the company.

The International Joint Commission which last summer determined the extent of the pollution of international streams, will further continue its work and hold sittings in Toronto, Detroit and Niagara, to take the necessary steps to prevent pollution and adopt a remedy best suited to the cases to be considered.

H. B. Donovan, of Toronto, Sales Manager of the Canada Paper Co., is on an extended trip to St. John, Halifax and other eastern points.

Cornelius Redmond, who for some four years was superintendent of the Montrose paper mill at Thorold, Ont., and resigned last fall to spend several months in California, has been appointed superintendent of the Kalamazoo Paper Co., Kalamazoo, Mich., and has entered upon his new duties.

J. F. Ellis of Barber-Ellis Limited, Toronto, and wife, who have been spending the past few months in Europe, have returned after an extended trip.

The McLaren Lumber Co. of Coleman, B. C., who own 181 square miles of timber limits, will treble the size of their plant and will be able to cut twenty million feet of lumber a year.

On June 24 the marriage took place in Toronto of J. B. O. Kemp, B. A. Sc., to Miss Emma Isabel Donovan, only daughter of H. B. Donovan, sales manager of the Canada Paper Co. The ceremony was performed in Bonar Presbyterian Church by Rev. Dr. McGillivray.

The offices of the Howell Trading Co., 109-111 George street, Toronto, will shortly be enlarged and renovated. The premises are also occupied by the Standard Paper Co., who specialize in building and roofing lines. A large warehouse is being erected at the rear, 80 x 100 feet in dimensions. It will be of brick, mill construction, five stories high and basement with six-inch Norway pine floors. The structure will be used by the Howell Trading Co., at the head of which is G. A. Howell, for storing paper, and all general supplies, the firm having developed a fine business in the storage line.

It is understood that in the tenders received by the T. Eaton Co., of Toronto, for five hundred tons of unglazed kraft, the contract was awarded to the Brompton Pulp and Paper Co. at East Angus, Que.

In a fire which visited Brockville last week the wood working department of the James Smart Co. was completely destroyed. The loss was \$20,000.

The annual meeting of the Canadian Press Association will be held in Toronto on July 9 and 10. The sessions were to have taken place at the Royal Muskoka Hotel, Lake Muskoka, in June, but had to be postponed owing to the Ontario elections as many members could not get away. The convention this month will be purely of a business character, all the entertainment features being eliminated.

J. B. Beveridge, Manager of the Dryden Timber and Power Co., Dryden, Ont., was in Toronto last week on his way to Chicago. The company report business as good. The output of pure kraft fibre has been increased and the general quality improved. There is no stock on hand and the firm have orders ahead for some time. The Howell Trading Co., Toronto, who are selling agents for the Dryden concern in Eastern Canada, have had their territory increased and now cover Michigan, Ohio, Iowa, Indiana and Illinois.

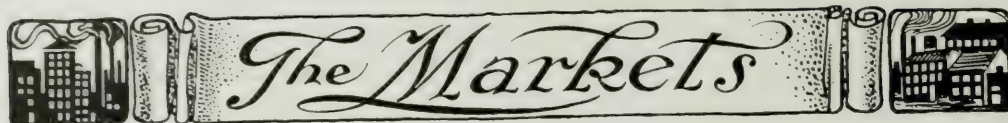
The demand for wax paper for bread wrapping purposes is steadily increasing and the British-American Wax Paper Co. of Toronto, who have six waxing machines, have recently taken still more space in the Darling building. The company now occupy about seventeen thousand square feet and intend next year to erect their own building which will be devoted entirely to manufacturing purposes. H. B. Hart, manager of the company, returned last week from a visit to the American plant of the company in Cincinnati, Ohio.

The Interlake Tissue Mills of Thorold, Ont., are manufacturing summer specialties and are putting several new lines on the market. These consist of Outing Sets in glassine paper bags composed of two heavy crepe paper table covers and twenty-five napkins. The company are also making decorative crepe for lamp shades, curtains, wall panels, carnivals, flower parades, etc. in ten, fifteen and twenty foot rolls and in thirty-six different colors. Sani-white crepe paper napkins, one hundred to the package, and travelers' sanitary packages, pocket size, with six towels, a portion of soap, a wash rag and portion of face powder are now being turned out. The company have also been busy producing fruit wrappers for British Columbia.

Joseph Kilgour of Sunybrook Farm, Toronto, captured five firsts, two seconds and seven other prizes at the first Hamilton horse show last week. Mr. Kilgour is the President of the Canada Paper Co. and his many friends are congratulating him on his success at the various horse shows in which Sunybrook Farm equines have taken part.

C. P. R. REORGANIZES FIRE PROTECTION STAFF

The Canadian Pacific Railway has recognized the local administration of the special fire patrols on its western lines, required by the Board of Railway Commissioners, by placing the matter under the direction of its Forestry Branch, of which Mr. R. D. Prettie is Superintendent, with headquarters at Calgary. The new arrangement affects the handling of fire protection work on all lines of the C. P. R. running through forest sections west of Fort William, Ont. The C.P.R. Forestry Branch has previously been closely associated with fire protection work, through the assignment of inspectors, but the new arrangements will greatly increase its scope by giving it administrative control as well. The new plan is altogether logical in an age of specialization.



The Markets

CANADIAN MARKETS

The market in news print continues very good and all the mills appear to be busy. Prices are well maintained and exports to the United States continue to grow rapidly. During the past fiscal year ending March 31, the value of print paper sent across the border was just double that of twelve months previous. The figures for the last fiscal year amounted to \$11,386,845 against \$5,692,126. It is expected that during 1914 when several hundred additional tons will come on the market that the gain will be equally as large. The export of mechanical pulp remains about stationary, according to the latest returns, while chemical pulp showed an advance of thirty-six per cent. in shipments to the south as contrasted with the year previous. Business with book, writing and coating mills continues fair and there appears to be a moderate amount of trade ahead. Orders are not so plentiful as a year ago and are smaller and harder to secure. The wrapping paper situation and the dealings in kraft remain about the same, price cutting continuing but not to any greater extent than for some months. Toronto wholesale paper houses report that the tone of business is improving slightly but matters are not expected to pick up very much during the usually quiet midsummer holidays. In ground wood things are only fair and complaints are still heard regarding water conditions. In the rag and paper stock arena there is little doing and prices are easier particularly on roofing stock. Following are the quotations, f.o.b. Toronto:

Paper.

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.05 to \$2.20 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.50, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.00c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphate bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila, B., \$2.50 to \$3.25.
 Manila, No. 2, \$2.85 to \$3.50.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$3.75 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$16.
 Ground Wood, \$21 to \$24, delivered in United States.
 Sulphite (unbleached), \$41 to \$43, delivered in Canada.
 Sulphite (unbleached), \$42 to \$44, delivered in United States.
 Sulphite (unbleached), \$55 to \$58, delivered in Canada.
 Sulphite (bleached), \$56 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90, f.o.b., Toronto.
 No. 1 soft wood shavings, \$1.75.

No. 1 mixed shavings, 45c.
 White blanks, 87½c to 90c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c.
 No. 1 Manila envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 25c to 27½c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.27½ to \$1.30.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinetts, 70c to 72½c.
 Flock, 80c to 82½c.
 Tailor Rags, 65c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manila, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manila, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manila, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS.

(Office Pulp & Paper Magazine, 206 Broadway, N. Y.)

June 25, 1914.

Ground Wood.

There has been a somewhat increased activity in the inquiries for ground wood pulp in the interval. Movement has been chiefly confined to regular shipments on contract request to consuming centres. The fact that water has been rather shortened in some of the western and middle western manufacturing centres has caused certain mills to make inquiries regarding deals for ground wood pulp. Among these inquiries are some from sources which have never before come into the local buying centre. A year ago a certain manufacturer was left with 25,000 tons of ground wood on hand. This enormous pile has been entirely sold with the exception of about 4,000 tons, which is gradually diminishing under spot demand in lots varying from 20 to 150 tons. The lowest price quoted for this stored pulp since the first of the year is \$15.08 at the pulp mill. Manufacturers have requested commission men to accept nothing lower than \$16.50 at the mill for fresh pulp. The feeling here is that the current year will be a good one in ground wood. Those who requested suspension of shipments have resumed their normal lots and pulp is now moving fairly well.

Chemical Pulp.

The weakening tendency in chemical fibre still predominates in the local market. Values are not firm in spot lots which have been closed as low as 1.70c on the dock for No. 1 unbleached sulphite. An offer of 2.60c for No. 1 unbleached sulphite has been made to certain manufacturers in the local market. Contracts are sparse and as paper manufacturers are pretty well aware that there is sufficient pulp in store on this side to meet their immediate needs, they are inclined to withhold from any contract arrangements which cannot be made at the low values for which they can purchase spot lots.

Mills have plentiful supplies on hand and are not anxious to buy any more stock until a better demand for their product exists. There seems to be an overproduction of sulphate and kraft pulp which has been firmly held for better values by foreign manufacturers. The general weakness of the paper market here, however, has necessitated some concessions in favor of the paper manufacturer. Spot kraft is not commanding more than 1.70c to 1.85c a pound. Contrast values are held by some of the largest importers at 1.80c to 2c, however it seems that this price range may fall off in the opinion of some.

Rags.

Rags and bagging are in poor demand and prices of all grades are very weak. Foreign rags are scarce in warerooms abroad and it is reported here that one of the largest packers in France cannot get sufficiently large collections of rags to keep his help occupied more than three days a week. Packers abroad also specify in their quotations that they are absolutely rock bottom and any counter offer will be useless.

Board.

Board mills are not as active as they were during the early part of the year and as a result there has been a good deal of easing in the value of the lower grades

of old waste papers and there are large accumulations of them in warerooms about the city. Book mills are a little less active and this has caused some easing in some of the better grades of old waste papers. Hard white shavings are in rather poorer demand and values are about 2.30c to 2.40c. Flat stock of all grades is in more demand than any other grade.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.
Ground Wood, No. 2, \$15 to \$17, delivered.
Unbleached sulphite, dom., 1.90c to 2.00c, delivered.
Unbleached sulphite, imptd., 1.85c to 2c., ex. dock, New York.
Bleached sulphite, domestic, 2.75c to 2.90c, delivered.
Bleached sulphite, imptd., 2.60c to 2.85c ex. dock, New York.
Easy Bleaching, imptd., 2.05c to 2.15c ex. dock, New York.
Unbleached sulphate, imptd., 1.75c to 2c, ex. dock, New York.
Bleached sulphate, imptd., 2.50c to 2.75c, ex. dock, New York.
Kraft Pulp, 1.70c to 1.85c, ex. dock, New York.

Paper.

Although there has been no real improvement in the general situation in the local market, most mills are running on fairly good time. There has been some difficulty with certain mills which could not meet their immediate obligations and they have asked extensions which will probably be granted. The market is one of hand to mouth buying. Advices from all parts of the country show that stocks are low and that jobbers are placing orders only in cases of necessity and of only such volume as will satisfy their immediate orders. The specialty business has been fairly good. Crepe tissues and paper towels have been in good demand which is probably the result of a widespread demand for sanitary service in public resorts. Paper cups are also in active demand. One of the large converters and tissue manufacturers was crippled by a total loss by fire. This caused a distribution of its business among the other manufacturers and has strengthened the market a little as certain mills which had planned a shut down during the summer are now sufficiently supplied with orders to keep all machines running full for some time to come. The demand for newsprint has been confined to requests for contract delivery. Although advertising has been light during the first half of the year, the Mexican war scare caused heavy editions and many extras which increased circulation so much as to bring about a heavier consumption of news than last year. There is a healthy demand for side runs probably due to the opening of many summer resorts. Some manufacturers are unable to make deliveries on new orders of side runs within the next six weeks. The local price is 2c to 2.05c for nines, twelves and fifteens, while eighteens command about 1.95c. Wrappings are in rather poor demand but values are fairly firm. Book papers of all grades are firm in value under a rather quiet demand as this is the off season. There has been considerable unnecessary cutting of prices by brokers and some manufacturers in the bag business which shows a little more activity especially for fruit and candy sizes. Boards are rather quiet but there is very little price cutting. As building has been slow this year there is but a poor demand for roofing and building papers. Writings are in rather quiet demand

but values are firmly maintained as manufacturers cannot afford to cut prices any further. Kraft papers are in poor demand and values are weak.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
 News, side runs, 1.95c to 2.05c.
 News, sheet, \$2.25, to \$2.30 f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13 $\frac{3}{4}$ c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c. del. east of the Miss. River.
 Writing paper, engine sized, 4 $\frac{1}{2}$ c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manila jute, 4 $\frac{3}{4}$ c to 5c, delivered.
 Manila, wood, \$2.40 to \$3.00, delivered.
 Kraft, No. 1, \$3.50 to \$3.75 f.o.b. New York.
 Kraft, No. 2, \$3.25 to \$3.50, f.o.b. New York.
 Boxboards, news, \$28 to \$30 per ton, delivered.
 Boxboards, chip, \$28 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.
 Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 40c to 42 $\frac{1}{2}$ c f.o.b. New York.
 Tissue, fourdrinier, 47 $\frac{1}{2}$ c to 50c f.o.b. New York.
 Tissue, jute Manila, 40c to 41 $\frac{1}{2}$ c f.o.b. New York.

THE BRITISH MARKETS.

London, June 20, 1914.

The British paper trade is anything but in a brisk state, which leaves it in common with most of the continental markets. Complaints are general of the small amount of business that is passing, and to make matters worse the export trade shows no signs of a revival. A couple of months ago it was chiefly the mills engaging in the production of packing, wrapping and other kinds of kraft paper that were mostly affected, but now the newsprint and fine printing and a rising paper mills are having a set back, and some of the mills in the Lancashire area are being badly hit by the want of new orders. This state of affairs means increasing stocks, with the result that prices must go down and an outlet found some place at a subsequent period, so that the mills may be cleared out. Naturally competition is very keen and a good deal of uneasiness prevails. Mills having a good connection amongst steady and constant consumers are about the only ones that can show any profit, but these depending largely on the export trade and with a small home connection feel the pinch of the depression more than the others. It is quite evident, however, that the present state of things cannot last much longer. All the printing and publishing houses are working steadily, so that they are consuming a fair

amount of paper, but nothing like that they consumed at this time twelve months ago.

Deliveries of sulphate and sulphite under contracts have been fairly large during the past month, and they give an indication of the size of the contracts that papermakers have entered into with Scandinavia. At present business in pulps is not active. Contracts for sulphate are being entered into, the low prices prevailing being the great attraction, but for sulphite business is on a hand to mouth principle, and sellers are firm in their quotations, so that contracts are few. The reports from Scandinavia and Germany that reach London show that the depression in the paper trade has a great influence on the pulp trade and there is no disposition on the part of buyers to go beyond small prompt parcels. The prices in England at present are about as follows:—

Sulphite Bleached No. 1	\$56.60 to \$61.50
Sulphite Easy Bleaching (No. 1)	37.20 to 39.60
Sulphite News	38.20 to 39.20
Soda Unbleached (No. 1)	34.70 to 36.40
Soda Kraft	32.00 to 33.50

For moist mechanical there is little enquiry, and little business is reported by the importing agents in London, who feel the depression very keenly. Prices are low, but most of the mills are well stocked and sellers are abstaining from making contracts until the buyers offer a reasonable basis to make them on. From Scandinavia comes the news that mechanical there is dull and featureless, and stocks are well kept down. Prices are about as follows:—

Pine, 50 per cent. moist (unwrapped)	\$10.00 to \$10.60
Pine, dry	22.30 to 30.00

There is a good demand for practically all kinds of rags, but supplies are not too plentiful. Prices are firm and in some cases a slight advance has taken place. During the past month about 50 tons of rags were exported to Canada. Esparto is now arriving in fairly large quantities and prices continue on the same high level. Indeed, the tone of the market continues steady to firm, while enquiry is somewhat limited.

The chemical market is brisk. Sulphur is \$27.50 per ton, caustic soda \$48.50 for 77 per cent., and \$48 for 76 per cent. Soda crystals are \$9.60, and saltcake \$9.90. Alum is \$28 to \$29 per ton, Bleaching Powder \$26 to \$28 in softwood casks, and ammonia alkali about \$20, according to the package. Rosin is remarkably dull, and values are unchanged.

Fillings and loadings, such as china clay, mineral white gypsum, etc., are rather quiet just now, the depression no doubt being the cause of the slackness. China clay is being produced quicker than it can be sold.

The Canadian General Electric Co., Ltd., has issued an attractive booklet showing the Electric Hoists, Monorail Cranes, Grab Bucket Monorail Cranes, Electric Winches and Winding Drums. Lines are carried which are of particular interest to paper manufacturers and publishers.

Messrs. Griffiths, of Kingsway, London, have placed on the English market a self-toning paper for photographic purposes. The paper acts automatically and experts say that it will revolutionize the art of photography—that is in the quick production of pictures. The paper is supplied in two grades, and men engaged in the photographic line and in the chemical line are speaking very well of it.

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VOL. XII.

MONTREAL, JULY 15, 1914

No. 14

Natural Resources First

In this issue appear two interesting statements on the international situation in pulp and paper affairs. The one is from a director of large Canadian interests, made while he was in the United States. This latter fact makes it all the more interesting in our eyes. In his estimation, Canada stands on the threshold of a wonderful new development, and is destined to hold the premier place in the pulp and news print industry in America. The other is the complaint of an American protectionist, T. O. Marvin. The present Wilson tariff, according to him, is working the ruin of the United States mills.

Both statements may be a little strong. Canada undoubtedly has wonderful potentialities in pulp, and on the other hand the States are slowly, but surely, passing the zenith of their glory as pulp and paper producers. However these matters may stand, there is one main lesson for both countries in these descriptions of conditions: the United States manufacturers are in difficulties because they have meagre wood supplies and fitful water powers. Canada's hope lies in her abundant wood and her steady power. Not that Canada has ideal conditions by any means—far from it. Her forests have been ravaged by fire time and again, and vast areas to-day lie in black waste or slightly covered with saplings, because fires got headway. But considering population, wealth and scientific advancement, our friends to the South have gained their experience under most deplorable circumstances, and at terrible cost. In Canada we have still a chance to profit by what has transpired on the other side of the border. If ever there was a time when a nation needed to bend every effort towards the proper utilization of the natural wealth on which prosperity depends,

it is our country, and the time is the immediate present. This is a point which cannot be too strongly emphasized. The demands of the United States upon Canadian forests will never be less, there is a very strong probability that the next dozen years will witness an extensive exportation of Canadian pulp and paper to European and South American countries, and our own demands are due to increase with tremendous rapidity.

Forest fires, wasteful use and the locking up of ripe timber and pulp wood through insufficient knowledge or inadequate laws are to be ranked with the dissipation of a poor man's wealth. Canada needs her wood, and needs her water. She cannot have either without proper care of her forests. Canadian manufacturers and the Canadian public in general have a greater problem than they imagine on their hands.

Accurate Measurement

The time is passing when science is to be associated with musty book shelves, unintelligible formulae and mazes of apparatus. Nowadays, if the manufacturer does not know the ordinary basis of scientific investigation, he is indeed an exception. Science is sliding into every day life as naturally as mathematical calculations have entered into the forecasting of markets. It is only a question of degree, and happily the extent to which the scientific man and the man in the street are co-operating to their mutual benefit is a point of every day notice.

Indeed there is really no distinction between the practical man and the scientific man these days. Practically every move which is made in a manufacturing

plant is merely part of which some are pleased to call science. The work of the technical man is largely one of measurement and the necessity for proper standard for measurement, and for adherence to rules of manufacture as indicated by these actual measurements, is universal when we are getting so close in our industries to the point at which the profit ends and the loss begins.

In one department the need of statistical information is very easily seen. It is impossible to market a product unless the extent to which the demand goes is known, and it is difficult to attain regular and satisfactory profits unless the state of the stocks is apparent. The American Paper and Pulp Association has done a great work in acquainting its members with the state of the markets throughout the United States and in the whole world. If Canadian manufacturers are to share in the undoubted benefits which accrue from a well managed trade, it will be necessary for them to co-operate to the extent at least of our American friends to find out exactly where business lies. As is well known, European shippers have had such a poor knowledge of their markets in America that the same product has been sold at three different prices. This is a condition against which Canadians should guard. The Canadian Pulp and Paper Association has made efforts in the past and is still bent on the collection of statistics which will enable the manufacturers to see exactly where the best markets are, and the extent to which they can afford to produce without loss. To such an end the support of every manufacturer should be freely given.

Protests Against Tariff

The July issue of "The Protectionist" contains an article by Thomas O. Marvin which is bitter against the present administration.

The intelligent and experienced correspondent of the New York Journal of Commerce summed up his account of the hearing on the paper schedule before the Ways and Means Committee with these words: 'All the evidence now developed goes increasingly to show that with reasonable efficiency paper can be made as cheaply in the United States as it can in Canada, no matter whether it is book paper or newsprint paper.'

It was easy to get the Democratic members of the Ways and Means Committee to believe this, but the experience of the past few months has demonstrated that this pleasing fantasy has no basis in fact.

If paper can be made as cheaply in the United States as it can in Canada, why is it that, with print paper on a free trade basis, the importations have increased threefold? If Canada cannot undersell the United States, why is it that practically all of the additions to paper mills during the last few years and almost all of the new mills constructed have been in Canada?

Our importations of printing paper from Canada in the fiscal year 1911 were valued just under \$2,000,000; in 1912 they were \$2,101,000; in 1913 they jumped to \$2,640,000. During the first three months of the cal-

endar year 1913 we bought \$1,543,000 worth of printing paper from Canada. In January, February and March, 1914, we bought \$2,840,000 worth; half as much in the first three months of 1914 as we bought in the entire twelve months of 1913.

Canada was not in a position, when print paper was first put on the free list, to take full advantage of the opportunities which we had so generously afforded her; but as soon as she recovered from her surprise at our amazing action, she began to increase her manufacturing facilities in order to take advantage of the unexpected opportunity. More than \$150,000,000 of new capital was invested in Canadian paper mills within a short period after the free listing of print paper. The development of our own paper mills is at a standstill. Under free-trade legislation the growth of the paper industry is beyond the Canadian border.

"Our newspaper publishers expected great benefits from this legislation which they exerted every effort to place upon the statute books, but they are paying more rather than less for paper and have brought serious injury to American manufacturers and workmen. At the present rate of importation more than \$12,000,000 worth of printing paper will be imported from foreign countries. This money will be sent from the counting rooms of American newspapers to the treasuries of German and Canadian mills. Not a dollar of it will be used to pay American wages or start the wheels in an American mill. It is money taken from Americans and spent with foreigners, and American newspapers will learn the witlessness of such a policy in shrinking returns and business depression. They will learn that legislation which favors a foreign industry and cripples an American industry will not appeal to the American sense of justice and that it does not accord with a wise and prudent national policy.

DUKE PAYS VISIT TO HARMSWORTH MILLS.

St. Johns, Nfld., July 13. H.M.S. Essex, with the Duke of Connaught and party, arrived at Notwood this morning and was received by Governor and Lady Davidson, who had returned by rail from the West Coast and were acting host and hostess for Lord and Lady Northcliffe.

The Duke was escorted to the new Masonic Lodge at Botwell and the building has been named Connaught Hall in honor of his visit. Three Donaldson liners in port joined in the celebration.

At noon the Duke left by special train over the Harmsworth Road to Bishop's Fall, ten miles distant to inspect the pulp mills there. A warm reception was also tendered him by the officials in the Harmsworth mills, the largest in the world.

FREIGHT RATES INCONSISTENCIES.

Toronto pulp men are interested in a recent case of freight rate inconsistencies which has come to light. From Scandinavia to New York, a distance of four thousand miles, the charge on pulp is \$3.00 per ton, while from Thorold, to Toronto, a distance of less than a hundred miles, the rate is \$1.80 per ton. Further confusion and dissatisfaction arises from the fact that the charge on pulp wood from Anticosti Island to Thorold is about 30 per cent less than the water and rail charge from Anticosti to Niagara Falls, a little distance beyond Thorold.

CYLINDER PAPER MACHINES

By **JOHN W. BRASSINGTON.**

(Written Specially for Pulp and Paper Magazine.)

The Fourdrinier Machine, originally invented by a Frenchman, M. Robert, and developed by an English firm, Messrs. Fourdrinier, was in its first inception essentially a European product, although much of the perfecting of the design into the present efficient apparatus was due to human ingenuity on the American side of the Atlantic.

The cylinder machine, however, is essentially of the New World, both in the original invention and in the development and improvement of the same. The cylinder machine derives its name from the wire covered cylinder which performs the same duties as the wire of the Fourdrinier Machine. The manner of construction of the cylinder and its connection with the upper couch roll and the wet felt exclude the possibility of its being shaken sideways. The fibres will, therefore, only deposit themselves on the wire cloth in the direction in which the paper moves, that is, lengthways.

As we all know, paper made on a cylinder is in this respect inferior to that made on a Fourdrinier wire, which being shaken sideways causes the fibres to interweave themselves in all directions. Cylinder paper has its strength in the direction in which it has traveled over the machine; it will split easily lengthways like wood, and with more difficulty across the grain.

Since it is impracticable to shake the cylinder, many ingenious arrangements have been designed with the intention of shaking or agitating the stuff, so that the fibres may be laterally deposited on the face of the cylinder.

Cylinder machines furnish an inferior paper, but they are cheaper and require less skill to operate than the Fourdrinier machine. The latter needs deckles, jackets, longer wires, and for the same weight of paper, requires more horsepower to drive. The diameter, and therefore, the wire surface of a making cylinder is limited, and the pressure of the pulp in the vat is the only means by which the water can be forced from it. Very heavy sheets cannot, therefore, be made on one cylinder, but if the paper from two or more cylinders is united on one wet felt, it will, after passing the presses and dryers, form a solid web. In this way with a multiplicity of cylinders, it is possible to make different thickness of board from different colored liners or fillers, in such combination as may commercially suit the market. It is to be noted that for the same weight of paper, the cylinder machine requires less horsepower to drive it than does the Fourdrinier; this fact is literally true, but it is to be remembered that for the heavier boards and papers, that of necessity pass slowly from the vats to the reel, that the corresponding torque at each intake shaft is largely increased in inverse proportion to the rate of the paper. It may be better for the machine owner and operator to remember that the horsepower required to drive a cylinder paper machine per foot per minute, is, on the average, three times as great as that required to drive a Fourdrinier machine at the same rate.

The apparent inconsistency between these two statements is reconciled when we remember that the average output per foot of speed of the cylinder machine is in the seconds of these assertions taken to approximate over three times the output of the Fourdrinier

machine at the same rate of speed. So, while the horsepower per ton of output is less in the case of the cylinder machine, when compared with the Fourdrinier machine, yet the pull of each belt on the pulleys of the intake shafts is often three times as great at any given moment on the cylinder machine than can be the case with the belts on the pulleys of the intake shafts of the Fourdrinier paper machine. The cause of the greater turning torque that sometimes obtains on the intake shafts of a cylinder machine is probably due to the greater thickness of the paper in the making; this thickness for the want of a better simile we might liken in its effect on the turning movement required to the effect on a wheel turning in the thick mud, as compared to one turning on a dry or slightly muddy road.

It is obvious, that although the cylinder machine is less complicated and mechanically speaking requires less skill to operate, that there is a much larger range of product and therefore, in a certain sense, a greater paper-making knowledge required. For instance, the thickness of the stuff may vary between wide limits, and the thickness of the board taken up by each cylinder will accordingly vary as the strength of the solution, and as the speed of the cylinder. The strongest board is made by a large number of cylinders giving a large number of ply to the same thickness of board. A thick board can be made on one cylinder by making the stuff thick enough, and at the same time, running the cylinder slow enough, but the quality of board so made is of necessity vastly inferior to board of the same thickness made in multi-ply by the use of a large number of cylinders.

We may as well interpolate here, that given a corresponding capacity in dryer surface, that the speed of output of the multi-cylinder machine is to the speed of output of the one cylinder machine, in proportion to the number of cylinders in the former.

The design of an efficient cylinder paper machine depends on the maximum and minimum thickness of board that is obtainable on one cylinder at the speed and output required. The slowest stock is boiled wood, that is, boiled wood board cannot be made as fast or as thick per cylinder as any other stuff. Mechanical ground wood, pulp board, or straw stock containing the lignine, the intercellular or more fibrous vegetable matter is always slow stuff. The fastest stuff is sulphate; therefore, thicker board can be picked up in less time on a single cylinder of this stock than of any other. Between the extremes, we have soda pulp, old newspaper and straw pulp treated by the soda process. It is apparent from the above that a considerable range of experience is necessary to obtain the maximum output from any given machine by using the proper percentage of water in the stuff for every kind of stock that may be in use.

The use of the making board and the proper placing of the agitators is of primary importance. The writer was told one day by a gentleman whose name stands high as a paper machine designer (Mr. V. G. Hazard) that many years ago, when starting up a cylinder machine, that was using a wool and shoddy stock for making carpet lining paper, that the greatest difficulty was encountered in getting the stuff to form on the cylin-

der. The stock was so light and so fluffy that it floated to the top of the stuff in the vat and refused to form regularly on the cylinder. The machine tender becoming impatient, took up the hose and asserting his intention of washing off the forming cylinder, turned the water on full force into the vat. The jet of water struck the cream or foam of stock on top of the vat before it struck the cylinder, and the result was to the delight of the bystanders, that a beautifully formed sheet of paper appeared at once on the forming cylinder. As a light stock will float, so also a heavy stock will settle, so it is evident that the best design of cylinder vat provides for the maximum of agitation; a corollary of this thought is that the stronger the agitation, the more interfluent the fibres, and therefore, the stronger the formed paper.

A little thought will soon convince that the question of the direction of the flow of the stuff with respect to the direction of rotation of the forming cylinder is apparently dependent on the specific gravity of the stock in use; a heavy quickly settling stock should be circulated to be successful against the direction of the forming cylinder; in the case of a light fluffy stock, prone to float if undisturbed, the forming cylinder should tend to draw it under the water; the direction of rotation of the forming cylinder and of the flow of the stuff being concurrent. If, however, proper agitating devices are used, the direction of rotation of the forming cylinder with respect to the direction of flow of the stuff is not of primary importance.

One of the best forms of agitation is obtained by figuring the inlet small enough for the stuff, so that the speed of entry of the stuff must be great in order to allow the machine to make its output; this puts it out of the power of the machine tender to partially spoil the strength of the product, and also form deposits of heavy stock in the vat by two little agitation. One of the most important items of the many that tend to the successful operation of a cylinder paper machine is that the machine tender should believe, and that his superior officer should believe, in the mystic effect of the machine tender's own personality on the output of the machine; given this belief in both parties, and the tender will do his best to obtain a record output each day, but if this belief fails in either to the knowledge of the tender, than all the good points characteristic of the machine itself will not save it from condemnation. Talking of machine tender efficiency reminds the writer of a story of a machine tender who lost his job because of incompetence. Getting home after his discharge, he sent his little boy to the mill for his personal belongings; he also gave the youngster a mud turtle to drop in the cylinder vat in as unobtrusive a manner as possible. Mr. Mud Turtle, true to his instincts, was never in sight when anyone was around, but he was very busy at other times, trying to climb that cylinder. To everybody's disgust, no one could make the "unfathomable" old machine work, so it was necessary to send for the discharged one who promptly proved his ability by surreptitiously removing the mud turtle, and everything went as smooth and as bright as wedding bells; all this tends to show how necessary machine tenders are when there are no practical brains in the office.

The problem of arranging for the proper capacity of the dryer nest for any given output of a cylinder paper machine, is somewhat difficult to the parallel case of a Fourdrinier machine, because the board on a cylinder machine arrives at the first dryer with a larger percentage of water in it than is the case with

the paper on a Fourdrinier machine. While the paper on a Fourdrinier machine may arrive at the receiving dryer with only 60 per cent. by weight of water, the board on a cylinder machine may arrive at the similar place with from 75 per cent. to 80 per cent. of water. The difference between drying a thick board containing a high percentage of water as compared with drying a thin paper with a relatively low content of water, is obviously large, and the methods adopted as the result of experience seem to show that a high temperature at the press end of the dryers is preferable in the case of a board machine; this is the reverse to the conditions that seem most suited to a paper machine as far as the writer's knowledge goes. It is apparent that the formation of steam in a board on the inside, before the outer layer of the board is dry, and therefore, permeable by vapor, is deleterious to the quality of the board, and this is evidently a condition obtainable only by high temperatures and pressures; for this reason it is good practice in the dryer nest of a board machine, to maintain the relatively higher pressures at the dry end of the nest.

In conclusion, it is curious to note that the output per inch of width of a cylinder machine that has the proper number of dryers, is somewhat less than the output of a Fourdrinier machine, also properly equipped. The reason for this discrepancy is beyond the analytical capacity of the writer, and is only stated here as the apparent result of reasoning based on the law of averages, as applied to the records available to him. While the following figures are not necessarily correct for all cases, yet they are of sufficient accuracy and interest to warrant the attention of the reader, being based upon probably the largest collection of authentic data on paper machines now in the possession of anyone.

Let us assume that W = the width of any paper machine in inches, that $W' =$ the weight of the paper made in pounds per ream of 480 sheets $36'' \times 24''$, that F = the speed of the paper in feet per minute; then a Fourdrinier machine making 30-pound paper at 600 feet per minute of $150''$ wide, will have a daily average output of $W \times W' \times F \times 19 \times C = 51.3$ short tons.

In the case of the cylinder machine, using the same symbols and the same constant (C) which really only places the decimal point we have $W \times W' \times F \times 17 \times C = 45.9$ short tons.

In order to make a comparison and illustrate the point, it is necessary to use absurd figures when referred to the cylinder machine. Applying the same formulae to 140 pound paper, which is about the thickness of the average postcard, and assuming that it can be made at 150 feet per minute on either machine, then the output of the two is as follows, basing our conclusions on empirical data:

The Fourdrinier = $150 \times 140 \times 150 \times 19 \times C = 59.85$ short tons

The Cylinder = $150 \times 140 \times 150 \times 17 \times C = 53.55$ short tons

These figures, possibly, show that the average cylinder machine is not operated as efficiently as the average Fourdrinier machine, either because of poorer development of design or of inferior adeptness of operation. It is hoped that the reader will apply the above empirical formulae to any actual case with which he is acquainted, and having done so, will let the writer know his conclusions together with any concurrent facts that bear on the result. It is only by pooling our knowledge that we can efficiently help one another.

THE CHEMICAL EVALUATION OF WOOD FOR PULP

By MARTIN L. GRIFFIN.

At a meeting of the Maine Section of the American Chemical Society held in Bangor, October 17, 1913, I showed the inadequacy of the cord measure as a unit for valuing pulp wood, resulting in great variation in the solid volume, due to various factors. As a better standard I advocated a solid unit, namely the cubic foot, and illustrated how such a unit could be adapted in practice without inconvenience. I also advocated a unit of weight as a still more reliable basis. There remains the valuation according to the amount of fibre wood will yield, which is the chief concern of manufacturers of chemical pulps.

To make effective any of these units as a basis for evaluating wood for pulp we must resort to an efficient system of sampling which will be truly representative. Such a system was described in my former paper.

The great need of such a basis for valuing wood is at once apparent when we stop to think of the great variation in the quality of the same species, depending upon its habit and conditions of growth. Poplars of our northern states differ greatly from those of the middle southern states. The measurement of value by cord or solid contents takes no account of yield in pulp. Other species of similar external characteristics are often mixed in, as Bass wood with Poplar, and Fir and Hemlock with spruce. Such mixtures in late years have been permitted, when the characteristics are near enough to cause no trouble in cooking. Aside from these differences in species, and habit of growth, there is the quality of the wood, as such, which should be taken into account in its bearing on yield of pulp. Wood is subject to disease and decay and all such defective wood will not give the normal product.

With a view to discovering the influence of these various factors upon the yield, a large number of determinations of the cellulose were made by the Cross and Bevan chlorination method.

The procedure was as follows:—

The stick to be tested was quarter sawn, and the sample was obtained by planing thin shavings from the face of the quarter. In this way the sample would include a part of the growth from the center to the bark. We found such thin shavings much more satisfactory than any other form.

Three grams of the shavings, previously dried at 100 deg. C., were boiled for about half an hour in 1 per cent sodium hydrate. The mass was then well washed and squeezed and placed under a bell-glass, into which a slow stream of chlorine gas was led. Complete conversion of the lignone will usually follow in one hour's exposure to the gas. It is then well washed to remove hydrochloric acid and impurities and placed in a two per cent solution of sodium sulphite containing two tenths of a per cent of sodium hydrate, and boiled for about five minutes. The fibre is then well washed with hot water, and this treatment with sodium sulphite and hydrate repeated if found necessary. It will be found almost pure and nearly white; but to remove the last residues of non-cellulosic matter, it may be bleached with hypochlorite or permanganate. If with the latter, it will be necessary to wash with a weak solution of sulphurous gas. It is then dried, weighed and results calculated.

The following table gives the characteristics of 24 samples of mixed spruce and balsam fir from Montmorency in Canada.

MONTMORENCY WOOD TEST

NOVEMBER, 1912

Kind of Wood	Moisture %	Weight of one C'rd		Area in one Cord		Volume in one C'd		No. of Sticks in One Cord	
		Wet	Dry	Solid sq. ft.	% Solid sq. ft.	Solid cu. ft.	% Solid cu. ft.		
4 ft.	24.44	3014	2277	24.22	75.70	96.88	75.70	80	From Pile behind Platform. Standard Wood
	31.00	3313	2286	23.60	73.75	94.40	73.75	109	From Pile on Platform. York's Standard
2 ft.	40.1	3990	2392						2 ft. Wood from Large Pile
	43.3	3992	2220						" "
"	38.4	3636	2240	49.4	77.2	98.8	77.2	178	" "
"	38.4	3616	2228	48.5	74.8	97.0	74.8	185	" "
"	48.7	4395	2140	51.65	80.8	103.3	80.8	210	" "
"	48.7	4255	2075	51.15	79.8	102.3	79.8	184	" "

The samples were selected to show the various factors influencing the yield in chemical fibre. Eight of these samples were chosen from wood of recognized good quality for comparison. From a review of the table and the samples we observe first—that density of annual ring growth is not necessarily proportional to specific gravity. Note numbers 9, 1, 7, 23, 24, and that specific gravity is not proportional to yield of fibre. This latter is also shown by numbers 2, 8, 21 and 22, where yield is fairly regular and specific gravity is irregular. This would indicate, as we would suppose,

that habit and environment have much to do with the quality of wood.

Second—We can establish very well, the influence of incipient decay upon the yield by reference to Nos. 12, 17 and 18, all of which are sound specimens and comparing these with Nos. 3, 4, 5, 6, whose annual ring growth will compare favorably and the specific gravity and yield are noticeably low.

The most important conclusion of all and the one we are perfectly safe in drawing is that there is great variation in the yield of chemical pulp, and that some

consideration should be given to this yield in fibre in valuing wood for pulp.

The yield per cord is found by taking the solid volume which I find to be about 100 cu. ft. and multiplying by the specific gravity. This will give the cord weight basis from which the yield in fibre can be calculated.

The volume yield is found by multiplying the specific gravity into the percentage fibre yield.

The specific gravity of wood is very quickly determined approximately by displacement in mercury instead of water. A small piece of the wood is weighed, a pin stuck into it, and immersed in mercury contained in a small graduate cylinder, when the volume displaced can be read off directly.

The following table shows the weights of the cord of mixed spruce and balsam fir containing different percentages of moisture and the dry weight, which averages about 2,200 lbs., free from moisture.

LABORATORY TEST OF MONTMORENCY WOOD
NOVEMBER, 1912

No. of the Sample	Kind of Wood	DESCRIPTION OF SAMPLE	Diam.	Rings per Inch	Sp. Gr. of the Wood Dried at 100°C	YIELD			Solid ft. per Cord
						% by Weight	% by Volume	Lbs. per Cord	
1	2 ft.	Sound, fine grain	10"	23 3	.4700	51.6	24.2	1515	100.3
2		Sound, fine grain	8 1/2	21.4	.3522	51.5	18.1	1132	
3		Dead Wood, medium course	8 1/2	14.1	.3697	49.5	18.3	1144	
4		5" of centre dry rot well established	9	13.1	.3535	47.2	16.7	1045	
5		4" of centre dry rot, poor	10	15.6	.3518	52.3	18.5	1157	
6		4" of centre dry rot, very poor	8	15.4	.3474	48.2	16.7	1045	
7		Fine grain, slight indication of dry rot surface	8 1/2	24.4	.4141	52.8	21.9	1370	
8			8	19.2	.3076	53.5	16.4	1026	
9			7	6.8	.3475	55.2	19.0	1189	
10		Sound, very coarse grain	8	10.7	.3365	54.1	18.2	1139	
11		Coarse grain, slight indication of dry rot surface	7 1/2	12.7	.3242	53.9	17.5	1095	
12		Sound	5	16.2	.3166	52.1	16.5	1032	
13	4 ft.	Coarse grain, sound	7	16.3	.3469	41.6	14.4	901	95.64 York's Standard
14		Dry rot and dead throughout, poor	5 1/2	10.2	.3242	47.2	15.3	957	
15		Coarse grain, dry rot well established throughout	8	12.0	.4094	54.0	22.1	1383	
16		Coarse grain, sound	5	12.5	.3347	49.2	16.5	1032	
17		Coarse grain, dead wormy	5 1/2	15.3	.4011	55.0	22.1	1383	
18		Medium fine grain, sound	8 1/2	12.9	.4333	54.5	23.6	1477	
19		Coarse irregular grain, dense, sound	7 1/2	12.0	.3556	56.1	19.9	1245	
20		Coarse, grain rather light, sound	9	12.0	.4291	57.2	24.5	1533	
21		Coarse grain, sound	7 1/2	19.7	.3597	53.0	19.1	1195	
22		Fine grain, sound	7	18.2	.3657	51.6	18.8	1178	
23		Very fine grain, dense, sound	10 1/2	24.0	.3391	57.5	19.5	1220	
24		Very fine grain, light, sound	6	23.0	.3368	59.0	19.9	1245	

Comparing the square foot cross section of a cord of two feet and four feet woods, we observe that the former is about 50 or 78 per cent, while the latter is about 48 or 75 per cent, showing that the voids in two feet wood are less than in four feet wood. Comparing the solid cubic feet we find it to be about 100 in the case of two feet wood and 95 in four feet wood.

From experiments not shown here, it has been proven that large wood contains more solid wood per cord than small sizes, in the ratio of about 96 to 92.

From these results it is apparent how important it is to the manufacturer of chemical pulp to know what his wood will yield and for his purposes, it should be valued accordingly. Progress in valuing wood in any other way than by the cord cost will be slow. First because all timber having a dimension lumber value will necessarily be valued by dimension. Second as wood finds various markets it will be valued according to the use it is put to in the highest market and the tendency to value all wood by the unit measurement of the present pulp market will persist. Meanwhile conditions are rapidly changing, even to the poorer grades of wood only are finding their way to the pulp mills and the question of supply and demand are determining factors.

So far as I know, manufacturers of pulp have done little or nothing to promote a better standard of valuing wood for their uses and we may expect no change until they take this matter more seriously in the interest of more efficient management of their plants.

WEDDING BELLS.

On June 30th, Mr. A. G. McIntyre, former superintendent of the Dominion Forest Products Laboratories and Editor of the Pulp and Paper Magazine, now manager of the pulp mill of the Bathurst Lumber Co., at Bathurst, N.B., was united in marriage to Miss Josephine Clarke, daughter of Mr. and Mrs. W. G. Clarke, of Bear River, N.S. The wedding was solemnized in the Baptist church at Bear River, by Rev. W. E. McIntyre, father of the groom. Mrs. Howard Canning and Miss Nan Clarke, sisters of the bride, were mother of honor and bridesmaid, respectively, and Mr. Archie McDonald of Montreal and Bathurst, supported the groom. Mr. and Mrs. McIntyre went immediately to Bathurst, where they will take up residence.

CANADA'S POSITION IN THE PAPER INDUSTRY

Paper Trade Journal Publishes Interview With Prominent Canadian.

Canadian pulp and paper manufacturers take a rosy view of conditions, present and future, in the Dominion. An interview with a director of four pulp and paper plants, and an active figure in the Canadian industry, makes plain the fact that the Canadians are fully alive to their possibilities. The views and statements presented, however, are of course those of the gentleman interviewed, and must not be considered as an expression of opinion by the Paper Trade Journal.

The international situation influencing the future of the great news print industry in Canada continues to develop points of importance. Although few conversant with the condition of the Canadian paper market at the present time may feel elated by immediate prospects, the fact remains that the general course of events in this country and the United States is playing strongly into the hands of Canada, and warrants the keenest optimism.

A survey of the news print mills in the United States and Canada, and some knowledge of the annual reports presented at recent meetings brings out a fact of the most vital significance. Those United States mills which have been far-seeing enough to acquire abundant pulp wood limits, and are equipped with plenty of water power which they can afford to use for mill purposes, and which happen in addition to be blessed with facilities for cheap water transportation, are making some money, and probably will continue. But there are numerous other news print mills, the directors of which face a perplexing situation. First of all the abolition of the tariff imposts on cheap papers has encouraged Canadian mills to load the American market with 1,000 tons of news print paper per day. That enormous and increasing importation means a lowered demand for United States products, a position which the paper mill owner south of the border faces with a degree of helpless amazement, and however reasonable and emphatic his protests to Washington may be, the ear of Congress hears only the roar of the printing press. During the past two years or more many of the United States mills have sought to escape by altering their product from news paper to cheap book paper, but here again they encountered a branch of the industry already overcrowded to the point of disappearing profits.

Some news print mills faced another predicament, which may not trouble Canadian plants for half a century or more—the predicament of water powers becoming too valuable to be used for grinding wood. Quite recently a United States mill, which years ago had developed a water power then considered of little value, received an offer of from \$25 to \$30 a horse power for their hydro energy. The owners were obliged to refuse the offer, for it would have meant the closing down of plants in which they had sunk half a million of their money. So they kept on manufacturing paper at a cost of \$25 to \$30 per lb. p., and expected their product to compete with Canadian paper made at \$3 to \$7 per lb. p., or even as in the case of the Ontario Paper Company at Thorold, power at \$12.50 delivered from Niagara Falls.

The denuding of the forests throughout the paper manufacturing states has brought on another problem

from which the Canadian mill escapes. Twelve months of good water power per year is not at all unusual with the large Canadian companies. Seven-months power is about the average south of the border. That means that for five months a year the American mill must buy pulp supplies from Canada or elsewhere, adding many dollars per ton to the cost of the output. Instead of improving with the years, this shortage of water during certain seasons has become more and more aggravated. Of course such a condition supplies a profitable market for Canadian exporters of ground wood, but even that advantage is being circumvented by the growing custom of Canadian limit owners to turn their raw material into paper and keep the big end of the profit in their own pockets. The latest illustration of this tendency to develop the industry to its fullest possibilities is in the action of the Abitibi Pulp & Power Company at Iroquois Falls, Ontario, which commenced as a pulp mill, and before marketing any of its product laid the foundations for a 200-ton per day paper mill.

Canadian pulp limit owners have often incurred the censure of United States pulp and paper makers by prophesying an exodus of all American news print paper mills east of the Mississippi into Quebec and Ontario within the next fifteen years. That seems a generous slice of optimism, but the facts are all in its favor. It is true, of course, that American capital has thus far been tardy in taking advantage of the obvious facts, for the only news print mill owned and operated by American capitalists is the Donaeonna, although the Abitibi is being financed largely through American interests as well. British capital is master of the paper industry in this country, but it can only be a matter of a few years until ventures similar to the Donaeonna mills become quite common, and American money shows itself alive to real opportunity.

Three factors control the success or non-success of the pulp and paper mill: Cheap and plentiful water power, abundant pulp wood supplies contiguous to the mills, good transportation facilities. In all three, Canada holds the whip hand. Whichever of the great Canadian mills one cares to examine, each item is seen to be present, in remarkable degree. Laurentide, Price Brothers; Booth's Ontario and Minnesota, Spanish River, or any of the other big plants are in practically every case possessed of splendid water powers and continuous supply, good pulp limits and first-class transportation by rail and water. By improved conservation laws there can be no reasonable grounds to fear the same carnival of waste and carelessness that has reduced the pulp forests and water powers of the United States to such alarming portions. With any sort of moderate care the chief assets of the Canadian mills should be made perpetual. At all events Canada has awakened to the danger of extravagance in time to guard the bulk of her resources. In the United States, however—and this fact means everything to the future of the paper industry—the idea of conservation arrived half a century too late. The damage was done, the forests were stripped, river beds became either swollen torrents or weakened rivulets, and no reforestation genius could repair these foundations of the pulp and paper mill in less than a cen-

tury and at stupendous cost. It was in acknowledgment of such facts that a director of a big Canadian news print company, the stock of which has passed through strange convolutions, and is not now paying

a dividend, said to the writer: "Within five years every existing news print company in Canada will be paying dividends not only on preferred but common as well. It is inevitable."

CHLORINE ACTION ON PINE WOOD

(Specially contributed to Pulp and Paper Magazine by Heinz C. Lane).

In order to ascertain the amount of cellulose contained in wood the Cross and Bevan way of testing is often applied. This consists in removing the Lignin and other non-cellulose substances through the action of moist Chlorine gases.

While Cross and Bevan made a close observation of the chlorination on jute, such figures were not generally known with reference to pine wood.

Professor Dr. Heuser, of Darmstadt, together with R. Sieber, C.E., made the following statements:

As it is the case with jute the chlorination of pine wood will form a certain amount of hydrochloric acid which in all probability is formed by liberating hydrogen from the lignin and combining with the chlorine. However, in the case of jute the amount of hydrochloric acid corresponds to the total consumption of chlorine, in such a way that half of the used chlorine is consumed by the formation of hydrochloric acid, while the other half is taken up by the jute itself in the shape of chlorinous non-cellulose products. On the other hand, the chlorination of pine wood liberates invariably more hydrochloric acid than would correspond to the absorption of chlorine of the wood. In this case the re-action could not very well be taken—as Cross and Bevan did with jute—for a simple exchange of hydrogen and chlorine which leads to the formation of a ligninchloride.

In order to get a clear picture of the chlorination of pine wood every minute detail of the reaction was observed. From time to time the chlorination was interrupted. In each case the amount of precipitated hydrochloric acid and the corresponding reduction in weight of the wood was determined quantitatively. Together with these quantitative tests a number of qualitative tests were made. After each interruption of the process the fibres were subjected to the treatment of lignin re-agents and the amount of oxycellulose was determined through the medium of methylene blue. With a microscope the state of the fibres was ascertained.

It was noted that the decrease in weight of the wood fibres corresponds to the formation of hydrochloric acid. The reaction works very rapidly in the beginning, in such a way that already after the first half hour most of the hydrochloric acid has been formed. After this time the fibres have had their greatest loss in weight, consequently during the same period most of the lignin has been removed. Up to the end of the second hour the formation of hydrochloric acid and correspondingly the decrease in weight of the fibres do not come up again to those obtained during the first half hour. The rate of increase in hydrochloric acid and the decrease of weight becomes constantly less. Especially after the second hour the reaction proceeds very slowly. However, under the continued chlorination—after 11½ hours—the figures for hydrochloric acid will again increase, while the weight of

the fibres becomes greater. This increase continues to the end of the test, 22½ hours.

The formation of oxycellulose takes place quite in proportion to the aforementioned results which was proven by testing the fibres in each case with methylene blue, and also through the action of the lignin re-agents and from observations obtained through the microscope. During the chlorination proper, in other words up to the point where nearly all lignin has been removed, only little oxycellulose is formed. The reason for this is that at the beginning of the chlorination only little cellulose is available for the oxidizing, and on the other hand, it seems that the liberated cellulose is immune against the influence of the chlorine as long as there is lignin present. This is the case when bleaching with hypochlorites. Only after all lignin has been removed hypochlorites. Only after all lignin are formed, and such quantities increase rapidly under the prolonged action of the chlorine. After 10½ hours chlorination nearly all cellulose, and after 22½ hours all cellulose has been transformed into oxycellulose. Such pronounced formation of oxycellulose explains the increase in hydrochloric acid and weight of the fibres.

The beginning of the formation of oxycellulose can be ascertained through the action of the lignin re-agents i. e., phloroglucin and anilinesulphate solution, also by coloring the fibres with a chlorinezinciodine solution under the microscope. Already after half an hour's chlorination phloroglucin and anilinesulphate will show no reaction, while the other lignin reagents with the exception of the unreliable ferroferriicyanide reaction, and the yellow coloring with chlorinezinciodine under the microscope will disappear only after two hours chlorination. This result is to be considered since after a half-hour's chlorination, there are still 79.5 per cent present of the original quantity of fibres; at this point not all of the lignin could have been removed. In other words the reaction of phloroglucin and anilinesulphate can not be looked upon as typical lignin reagents.

Very likely they can be traced back to impurities in the lignin. These impurities appear in smaller quantities in the wood than the lignin proper—a presumption which Klason and others have already made, and is hereby confirmed. While on the other hand these color reactions are due to aldehyde groups of aromatic bodies, they evidently disappear because such aldehyde groups have but little resistance against chlorine.

As typical lignin reagents the following will have to be looked upon. The Maule Reaction, which allows the conclusion that lignin is a quinone formation, furthermore the yellow coloring with chlorine gas, the black coloring with concentrated sulphuric acid, the yellow coloring with chlorine-zinciodine solution under the microscope, and finally up to a certain degree the ferroferriicyanide reaction. Only when these reagents

fail to show any reaction the cellulose is free from lignin. And this is the point where the oxydizing and destroying influence of the chlorine begins.

The original heavy formation of hydrochloric acid is in no way proportionate to the amount oxycellulose contained in the fibres. The quantity of hydrochloric acid is rather great, while only traces of oxycellulose are present.

In other words the hydrochloric acid can not be dependent on the formation of oxycellulose. Special tests have proven that no other acid but hydrochloric acid is formed, f.i. acetic acid.

The total quantity of hydrochloric acid after two hours' chlorination was 32 per cent, corresponding to 31.1 per cent chlorine. However, for the formation of the chlorated reaction products only 9.47 per cent of chlorine was used. The plus of the hydrochloric acid might be explained if one remembers that the lignin does not resist the chlorine, but becomes oxydized and destroyed. Thus more chlorine is used than would correspond to the formation of a lignin-chlorine. On the other hand the plus in the formation of hydrochloric

acid might also be due to the reaction of chlorine with other non-cellulose bodies in the wood.

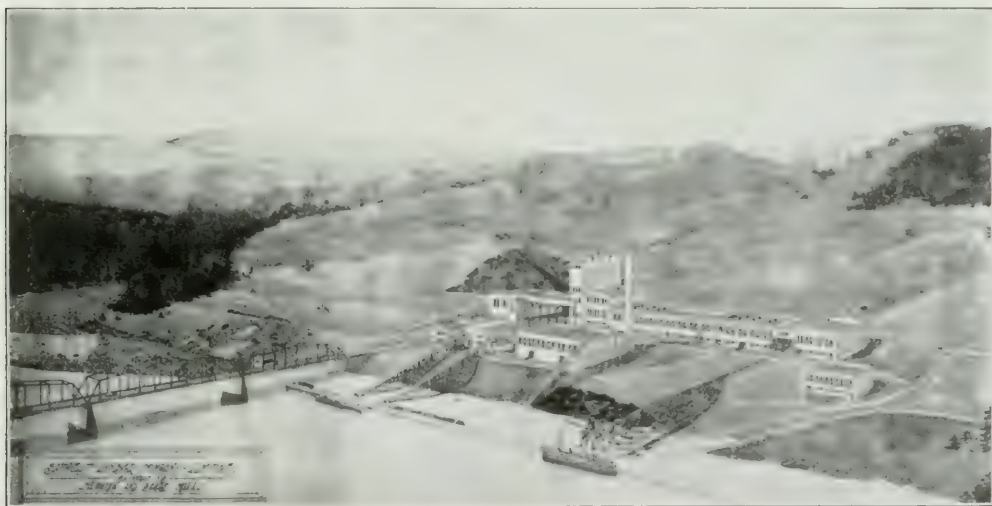
The chlorated product was an amorphous, dark yellow powder which was produced at a yield of only 7.1 per cent. Although this yield could with special arrangements be somewhat increased still, it is so small, that the fact seems to prove the supposition that the lignin becomes further decomposed through oxydation. These decompositions are evidently soluble in water, and are lost during the washing process—as was the case in these tests. The amorphous powder contained 47.03 per cent carbonates, 4.59 per cent hydrogen and 22.66 per cent chlorine.

Although the analysis would always show figures that compared well with each other still this could not be taken as a proof for the existence of one certain unit, such as "lignin chloride". It is much more likely that in the "chloride" we have a mixture of chlorinated products. It does not seem feasible that the lignin should resist the oxydizing effect of the chlorine upon the wood, especially if the lignin is taken for an aromatic body with hydroxyl groups.

PLANS FOR NEW MILL MATURING

Preparations for the erection of the proposed Sulphite and Board mill of the Bathurst Lumber Company, are going rapidly forward under the direction of Mr. A. G. McIntyre.

2,800 square miles of timber lands tributary to the mill, and has the best storage ground for logs, in Bathurst Harbor, on this continent. The wood cut on these limits, is at least 80 per cent black spruce, which is



PROPOSED SULPHITE MILL. BATHURST LUMBER COMPANY, BATHURST, N. B.

This mill will be built of concrete and steel, and will manufacture 25 tons per day of bleached Mitscherlich sulphite pulp, and 60 tons per day of steamed Container Board. This mill will later be enlarged to a News and Ground Wood Mill. It is located at the mouth of the Nepisiquit River, on Bathurst Harbor, and has railway and ocean connections. The company owns

the best paper making fibre there is. The small wood will be used in the pulp mill, the large logs will be sawn at the company's two saw mills on Bathurst Harbor, which are sawing 250,000 feet of lumber per day.

It is expected that the mill will be in operation some time next summer, about July or August.

UNITED STATES NOTES

(Special to Pulp & Paper Magazine).

The recent announcement by the Oxford Paper Company that it would spend \$150,000 in enlarging the capacity of its plant in Maine, does not seem to verify the prediction that the free listing of newsprint paper in the new tariff would drive the manufacturers to the wall, or across the Canadian border. In connection with such predictions, the following is quoted from the "Philadelphia Record":—

"We observe in one of the commercial papers that 'advances have occurred in many lines of cotton goods.' How is that possible under a Democratic tariff? From another market review we learn that manufacturers of woollens 'feel that they can successfully meet foreign competition with much better prices than prevailed during the current season.' In other words, they were not so much hurt as they thought they were. There is an order in the market for 45 miles of iron pipe from Persia, and an organ of the iron trade says that, while Germany may get a good deal of this, we shall probably get the larger sizes, 'the leading producer here having taken a large order for the same line last year.' That is, we competed with Europe last year, and can this year, in making iron pipe for Asia. In the last few years several cargoes of pig iron have been received in this country for casting into pipe for foreign markets. Can our protectionist friends explain this if it cost more to make commodities here than it does in Europe?"

The final conferences between the officials of the International Paper Company and the committee representing the labor unions with which its employees are affiliated, took place at the Continental Hotel, New York, on July 2. The result of this conference was the signing of an agreement for a year, dated from May 1, 1914, when the last agreement expired.

It is provided in the agreement that overtime will be paid to all employees, not less than four hours' overtime to be paid when less than four hours' overtime are worked. Time and a half in addition to straight time is to be paid for work done on legal holidays. The company did not concede all the advances asked for, but increases in wages, according to the number of babies in the respective plants, have been conceded to the engineers and firemen. These advances are to be retroactive to May 1 of this year.

No strikes or lockouts will take place during the term of the agreement; a system of arbitration of all disputes being provided for. The bonus system is to be discontinued, and a standard wage scale is to rule in all departments.

Legation conferences had already taken place, and to meet a strike, negotiations were made on both sides. The settlement affected about 9,000 workers in 32 mills in 22 cities. The employees worked for paper, news and the country yesterday, & other privileges will continue.

Since the conference with the company started agreements have been reached with other paper manufacturing companies throughout the country. The largest of these are the Great Northern, the St. Croix and

the Great Lake companies, which employ in the aggregate about 7,000 workers.

Following the announcement in the last issue of the Pulp and Paper Magazine that the old wall paper manufacturing concern of Janeway & Company at New Brunswick, N.J., would retire from business, is the announcement that several of the stockholders, including a number of employees of the plant, have given power to F. M. Yorston, secretary of the Board of Trade of New Brunswick, to negotiate for raising funds to continue the concern as a going business.

William R. Janeway, president of Janeway & Co., recently announced that the factory would close down and the stockholders who have signed the paper giving Mr. Yorston power to act are desirous of interesting capital so that the company may be continued. All are practical men in the wall paper business and have been connected with the industry for a long term of years. It is understood that the outlook is bright for success to attend their plans.

These corporations have received charters at the State House: Falulah Paper Company, Fitchburg, to acquire and carry on the business of the Falulah Paper Company; capitalized for \$200,000. Albert N. Lowe, E. P. Lowe, J. A. Lowe, G. R. Lowe, R. P. Lowe, all of Fitchburg.

The summer dullness in the paper trade is in evidence, and a number of the paper mills in Holyoke, Mass., are on short time. Announcement was made on July 1 that the Holyoke, Sinden, George C. Gill, and Mt. Tom divisions of the American writing paper company would be shut down for the lack of orders and the Beebe and Holbrooke division may also be affected. The Crocker-McElwain company will also be closed for a time. The textiles seem to be a little better, although business is far from brisk for many.

The Keyes Products Company, of Montville, Conn., has several large orders on hand for their building boards and are running urgent orders. They have introduced a fireproof and weatherproof composition for their latest product, which will doubtless attract the attention of the trade.

The Kankauna Paper Novelty Company, whose factory at Kankauna, Wis., was visited by fire last week, is again running full blast. Extra help has been hired and the factory is now running night and day. The insurance has been satisfactorily adjusted and carpenters and masons are at work repairing the building where it was damaged by fire. The repairs will be completed some time this week.

Paper dealers of Washington, D.C., fanned well in the distribution of contracts for furnishing the various Government departments with the paper and stationery during the next fiscal year. The contracts have just been approved by Secretary of the Treasury Mc-

Adoo, and were announced by the General Supply Committee. The firms in question are R. P. Andrews Paper Company, R. Carter Ballantyne, Mathers-Samm Paper Company, Charles G. Stott & Co. The contracts amount to more than \$100,000.

* * *

The demand for newsprint has fallen off since the first of May and this is having its effect upon the net profit of the producers, of which the International Paper Company is one of the largest.

There is not much doubt, however, but what the International Paper Company will show for its fiscal year a fair margin above the 2 p.c. dividend which it pays on its preferred stock. The nominal quotation on news-print is 2.05 cents, but Canadian manufacturers are offering it at two cents in the New York market. The Canadian manufacturer has an advantage of \$6 per ton in the cost of making newsprint and is thus able to undersell domestic mills.

* * *

J. R. Koons & Son have reorganized with a paid-up capital of \$50,000, under the name of J. R. Koons and Son Company. S. Rufus Koons is president and Harry Greenberg is secretary and treasurer. These gentlemen are also the controlling factors in the English Fibre Board Company, Pen Yan, N.Y., who have taken over the old Schutz mill, and expect to have it running within the next thirty days on press and similar grades of fibre boards.

* * *

An unusually large paper making machine is being built at the Beloit Iron Works, Beloit, Wis., for a Michigan paper mill. The machine is of the latest type of construction and it is equipped with 81 drying rolls. The rolls are 42 inches in diameter and 120 inches long and the whole machine is an extra large sized one. Several other unusually large drying rolls have been cast in the Iron Works foundry during the last few months.

* * *

A number of the stockholders in the Brunet Falls Manufacturing Company, at Cornell, Wis., inspected the plant on June 29. Among them were J. Davidson and W. I. Osborne, of Chicago. Mr. Davidson is receiver of the Kansas City, Mexico and Orient Railroad Company. The party is traveling in his private car. The party spent the entire day going over the property and returned in the evening to Minneapolis, Minn.

* * *

In order to make necessary repairs, the plant of the S. D. Warren Company, Westbrook, Me., suspended operations at 8 o'clock on the morning of July 4, and remained closed until midnight of Sunday, July 12, a period of nine days, including one holiday and two Sundays. While the majority of the employees of the company had the week's vacation, there was a large crew on repairs working daily during the nine days the mill was shut down. This is the longest period of time the big mill has been still since the freshest of 1896, and it is probable that the annual output of paper will be curtailed many thousand pounds.

* * *

At the beginning of the hearing before representatives of the Interstate Commerce Commission at Kalamazoo, Mich., on June 29, paper manufacturers of Michigan charged that discrimination in freight rates was responsible for paper makers of this State to lose practically all of their western trade. Among other things it was charged that Wisconsin was favored to a great extent by railways, and that as a result ship-

ping rates to points practically the same distance as from the various paper centres in Michigan were much cheaper for Wisconsin mills.

* * *

The first shipment of paper ever brought into the harbor of Detroit, Mich., was received last month by the Detroit Free Press, when the steamer Jesse Spoulding landed 1,900 rolls, weighing over 850 tons. While paper manufacturers have often figured on water transportation, it has never before been attempted. When this commodity was placed upon the free list, the Lake Superior Paper Company, of Sault Ste. Marie, Ont., with a plant easily accessible to the water, at once chartered the steamer Jesse Spoulding to ship its product. James S. O'Brien, one of the officials of the paper company, came accompanying the cargo. This is the second shipment of paper made by the company by water and represents a great saving over rail shipments.

* * *

The papermakers' strike in the mills at Fulton, N.Y., which has been in progress since May, 1913, was declared off on July 1 by the Papermakers' local. It is understood that the men gained nothing from their long struggle and returned to work at the same terms as prevailed when they quit.

The men were working in eleven and thirteen hour shifts and struck to have the shifts reduced to eight hours at the same pay as for the longer shifts, and recognition of the union. It was said that neither of the concessions asked for was made. When the strike began 150 men quit work, but as the struggle progressed with no apparent chance of settlement the men sought work elsewhere until but forty of the strikers remained in Fulton. Most of these had secured jobs in the city. Now the strikers may return without hindrance from the union. The mills affected by the strike were Oswego Falls Pulp and Paper Company, the Granby Paper Mills, the Victoria Paper Mills, the Eureka Paper Mills and the Northend Paper Mills.

* * *

The new factory of the American Box Board Company, at Grand Rapids, Mich., to be occupied by the make-up departments, was completed about July 1, and the new paper mill for the manufacture of the box board will be ready for its equipment early in August. These two buildings will give the American Box Board Company four large buildings with a total frontage of more than a quarter of a mile, and a floor capacity of about 300,000 square feet.

The new paper mill is solid reinforced concrete, 275 x 80 feet, one story and basement, with a wing for the heating room 175 x 125 feet. The old paper mill is 440 x 80 feet, three stories, and the building now occupied by the corrugating department, which will be used for warehouse purposes, is 210 x 98 feet, three stories.

A tunnel will be built from the new paper mill through the old paper mill to the new factory on the east side of Godfrey Avenue, and a track will be laid for electrical trucks for handling the stock.

* * *

It is stated that when the present extensive improvements at the plant of the Munising Paper Company, at Munising, Mich., are completed, the company will add to its present product a high-grade bond paper. It is expected the extension and repair work will be completed, and all modern machinery will be installed. A new slab mill is being built for the proper preparation of slabs. A bleach plant with a daily capacity of about twenty-five tons will be installed.

The pulpwood mill of S. D. Warren Paper Company at Kennebec, Me., has just been started for the season, and shipments of pulpwood have been begun. The mill is now run by electricity, the power being furnished by motors installed recently by the Central Maine Power Company, and everything is working in fine shape. The mill will ship about seventy carloads of pulpwood per week, and the amount of poplar used for the season will be about 150 cords.

James Wright, who resigned as assistant manager at the plant of the Consolidated Water Power and Paper Company at Grand Rapids, Mich., has taken the position as secretary to the president of the Bryant Paper Company, at Kalamazoo, Mich. Mr. and Mrs. Wright will spend a month visiting friends and relatives in New York State, and expect to remove to Kalamazoo so that he may assume his new duties on August 1. Mr. Wright was with the Grand Rapids company seven years, going there from Neenah, where he was with the Kimberly-Clark Company for a number of years.

The Keyer Folding Box Company, at Dayton, Ohio, which went into bankruptcy several months ago, has sold the plant, on Ringgold Street, to the Lindley Box and Paper Company, of Gas City, Ind., at its bid of \$7,100 subject to confirmation of Court. The buyer is undecided what course to pursue, but it is probable that it will be removed from this city to Gas City.

The sale covered machinery fixtures and a patent on folding boxes, and the bid was only slightly in excess of two thirds of the appraisement. Only one bid was received for the equipment by Trustee Neumann, who is the general manager of the Dayton Paper Novelty Company.

The Inland Empire Paper Company of Spokane, Wash., announces the appointment of J. E. Carroll, a New York paper manufacturer, to the position of general superintendent of the company's factory at Milwood. The place was made vacant by the recent resignation of W. H. Goodenough. Mr. Carroll has been engaged in the paper making industry for the last 22 years. During recent years he has been with the Raequette River Paper Company, of Potsdam, N.Y., and prior to taking that position he served with the manufacturing staff of the Kimberly Clark Company, of Neenah, Wis.

Spontaneous combustion started a troublesome blaze in No. 3 store of the United States Envelope Company's building in Cypress street, Springfield, Mass., last week. About 4 o'clock in the morning the automatic alarm in the building sounded. The mechanism was released by the automatic sprinkler above the waste chute in which the fire started. The perfect adjustment of the sprinkler undoubtedly saved the building from much damage, for when the firemen arrived in response to an alarm from the private box, 412, they found much difficulty in getting to the heart of the blaze. The alarm ends in the centre of the tissue paper department room, and many coils of tissue paper were damaged by the water.

The shipment of pulp at the Port of New York for the week ending July 7 is reported at 1,180 tons. Of this 2,000 tons in 14,500 bales came on the steamship Astoria from Chibouctou, Que. This consignment was

delivered to the Tidewater Paper Mills Company, of Bush Terminal, Brooklyn.

The Nashua Card, Gunned and Coated Paper Company, of Nashua, N.H., has increased its capital from \$200,000 to \$400,000 by the issue of 2,000 additional shares of common stock at a par value of \$100. The stock will be offered to stockholders in proportion to their holdings. This gives the company \$100,000 of preferred and \$300,000 of common stock.

The New York office of S. D. Warren & Company, manufacturers of book and coated papers, underwent a change in personnel on July 1. Jesse W. Clark, formerly manager of the manufacturing department of the Osborn Co., calendar makers, at Newark, N. J., is now in charge of the office at 25 Madison avenue. Benjamin Van Wyck, who has been previously identified with the trade, is city salesman.

Receivers Alexander W. Pound and William R. Siegle sold the United Indurated Fibre Company plant in Lockport, N.Y., on July 1, to Attorney Philip W. Russell, of New York City, for \$300,000. Mr. Russell submitted the only bid. The amount was the same that Justice Pound said would be the lowest bid received. It is understood that the H. W. Johns-Manville Company will resume control of the Lockport plant; that the company will be reorganized; the plant started in operation before fall, and that a number of new lines of manufacture will be developed. Federal Judge John R. Hazel today granted an order calling on all concerned to show next Friday morning why the sale should not be confirmed. The receivers are running the plant until the show-cause order is considered in Buffalo on Friday. So far as can be learned, none of the creditors of the old company will protest the receiver's sale. The creditors will receive about 80 cents on the dollar.

TIMBER LIMITS SOLD.

Toronto, July 7.—Hon. W. H. Hearst, Minister of Lands, Forests and Mines, today announced the acceptance of tenders for the sale of three large timber limits in the Metagoni Indian reserve. The area of each of the limits is 36 square miles, and the awards are as follows: Berth No. 1 to J. J. McFadden, Renfrew, red and white pine \$8 55 per 1,000 feet. Berth No. 2 to J. J. McFadden, Renfrew, red and white pine, \$4 56 per 1,000 feet. Berth No. 3 to Hope Leather Company, Red City, Mich., red and white pine \$8 55 per 1,000 feet. All at \$9 dues and \$10 per mile ground rent. In each case the tenders were awarded to the highest bidders.

ONTARIO'S PULP AND PAPER.

Julius D. Dedler, United States Consul at Toronto in respect on Ontario industry states that of the \$24,000,000 invested in the Canadian paper trade, \$4,700,000 is invested in Ontario, and that of the \$40,782,977 invested in the Canadian wood pulp industry \$14,050,000 is invested in Ontario. As to production Ontario now makes \$4,000,000 worth of paper and of a total of \$14,000,000 for Canada and \$4,487,827 worth of pulp out of a total of \$9,137,400 for Canada.

Canadian Press Association Meets in Toronto

(Special to Pulp and Paper Magazine).

Toronto, July 11.—With a record attendance, the fifty-sixth annual meeting of the Canadian Press Association was held in the King Edward Hotel, on Thursday and Friday of this week. Editors and publishers were present from all parts of Canada. There are now 735 members of the association and the receipts from fees for the present year have so far amounted to \$7,700. It will be remembered that last year the rates for membership were radically increased but there has been scarcely any falling off.

The Press Associations of the Maritime Provinces, Western Canada, Alberta, and Eastern British Columbia are now included as territorial associations of the Canadian Press Associations. President Hal B. Donley, of the Simcoe Reformer, presided over the deliberations, which were unusually important, in view of the threatened increase in postage rates.

The Postmaster-General at Ottawa recently announced that the rate of postage on newspapers was one quarter cent a copy instead of a bulk rate of one quarter cent per pound, and made the further announcement that, where letter carrier delivery is in operation, a separate charge of not more than one cent a copy would be made for the delivery of newspapers by carrier. The report of the Postal Committee was read by J. M. Inrie, who reviewed the negotiations which had been in progress since 1912, when, at a joint meeting of the Canadian Press Editors and the Canadian Press Association, action was taken, which resulted in a report on the postal situation being made for the organization by M. E. Naeffels, of the Montreal Mail. On the basis of this report, the Associations made to the Postmaster-General recommendations which, if put into effect, it was believed would have rectified abuses of the second-class mailing privileges and relieved the pressure on the Post Office Department, this being the object the Postmaster-General had declared his desire to effect.

Negotiations with the department were continuing during the present year when it was discovered that the third reading in the Commons had given to Bill No. 147 the effect of taking the control of newspapers postage rates out of the hands of Parliament and placing it in the hands of the Postmaster-General. The Postal Committee immediately protested against the principle of this Bill, first to the Postmaster-General, and, that being ineffective, to the Senate. The latter body, amending the Bill, it was withdrawn by Hon. Mr. Pelletier. More recently a notice was sent to publishers as already outlined, whereby the Postmaster-General proposed to exercise certain powers claiming that there is no statutory regulation which compels him to let one-quarter of a cent per pound rate be applied as a bulk rate and intimating that he can make it one-quarter of a cent per copy.

The effect of this charge, if put into practice, would be an enormous increase in the postage rate. Hon. Mr. Pelletier also claims that, under an old clause, which has been in existence since the days when postage was collected from the recipients of mail, he can impose postage on newspapers up as high as one cent a copy. It was suggested by the Postal Committee that every member of the Association make it a point to protest personally to the Member of Parliament for his constituency against the transfer of the control of

newspaper postage from Parliament to the Department, and against any new interpretations of the Act which might injure so deeply the newspaper business as might those recently outlined by the Department.

A new postal committee was appointed at the convention with P. D. Ross, of the Ottawa Journal, as Chairman. This committee presented the following report in connection with the various questions which had arisen in regard to newspaper postage. The report was adopted by practically a unanimous vote.

First—that a further interview be had with the Postmaster-General by the committee at an early date with a view to an amicable understanding; any suggested re-arrangement of rates by Parliament arising therefrom to be reported to a general meeting of the association for instructions before acceptance. Second

—That in case such interview with the Postmaster-General does not seem to promise a satisfactory outcome, the Postal Committee be authorized to organize as large a deputation of members of the Association as can be secured to wait upon the Prime Minister to protest in the strongest possible way against the removal of control of postal rates from Parliament and against the proposed arbitrary rulings of the Post Office Department in connection with rates. Here the matter stands at the present time.

Profitable sessions were held of the daily, weekly, and trade and class sections and the principal officers elected were: President of the Association, W. M. O'Boirne, Stratford Beacon; Vice-Presidents, Maritime Provinces division, R. L. Cotton, Charlottetown Examiner; Ontario and Quebec division, W. E. Smallfield, Renfrew Mercury; Manitoba-Saskatchewan division, W. F. Kerr, Regina Leader; Alberta and Eastern British Columbia division, J. H. Woods, Calgary Herald; Western British Columbia division, John Nelson, Vancouver News Advertiser. Sec. J. M. Inrie, Toronto; Treasurer, J. H. Cranston, Toronto Star.

J. G. Elliott, of the Kingston Whig, was elected chairman of the daily division; E. Roy Sales, of the Port Elgin Times, of the weekly division, and Col. J. B. MacLean, Toronto, of the trade and class section.

J. F. MacKay, of the Toronto Globe, was elected chairman of the Paper Committee; E. F. Slack, of the Montreal Gazette, of the Labor Committee; W. J. Taylor, of the Woodstock Sentinel-Review, of the Advertising Committee, and P. D. Ross, of the Ottawa Journal, of the Postal Committee. The report of the Paper Committee, which was presented by John M. Inrie, Secretary of the Association, referred in detail to the present news-print production in Canada, the increased tonnage for the coming year, the augmented shipments to the United States, and furnished statistics which have already appeared in the Pulp and Paper Magazine. One matter touched upon was the way in which Canadian newspapers were discriminated against in the matter of freight rates as compared with rates on shipments of news-print across the border. It was stated that over one thousand tons per day were being sent to the United States and that before long this would reach 1,200 daily.

The "International" number of "The Pulp Maker," London, is a most creditable production. Articles on the pulp and paper situation all over the world, in seven different languages, and special contributions on foreign countries by the Editor, S. Chas. Phillips, M.S.C.I., through which he made a tour during the year.

Ottawa Notes

Ottawa, Ont., July 10.—Canadian publishers were directly interested and Canadian paper manufacturers indirectly concerned, in the announcement which has been made by the Post Office Department that the rates of newspaper and periodical postage have been advanced. Where the old rate was one-quarter of a cent per pound for this class of mail matter, the new rate will be the same where there is no delivery, but will be one cent per pound where papers are delivered by carrier.

In other words, postage on a Canadian newspaper will in future be about equal to the cost of the paper itself, and in some cases where evening dailies are mailed at a reduced price, as in the case of a well-known Montreal evening paper, will be much greater than the price of the paper. It is not thought that this rate is intended to be permanent, but it is accepted by publishers that there is to be an appreciable increase in the cost of mailing newspapers and periodicals after this in Canada. A conference will be held shortly between the Post Office Department and the publishers to endeavor to arrange a compromise.

As a result of the exceptionally rainy weather during the past two weeks, the water in the Ottawa River has risen and both in this stream and in the Gatineau Valley, the level is high enough to float logs, which threatened to be hung up for the summer. Opposite the Rideau Canal locks near this city, the Ottawa river has now risen over two feet.

The bursting of the conservation dam at Lake Temiskaming, of course, contributed to this result. Later news received from the scene of this accident is to the effect that it has resulted in leaving millions of logs, and much pulpwood, high and dry on the shores of Lake Temiskaming. This condition of affairs is to be remedied, however. Advantage has been taken of the fact that the city is full of unemployed Ukrainians and other foreigners to hire large numbers of them to go to Lake Temiskaming and clear its banks of this lumber. A firm of government contractors is doing the work, and it is expected that all the logs will be successfully floated. The lumber camps have also absorbed a considerable proportion of this surplus labor.

Increases in the tariff on decolouring paper, and on caustic soda, both of which are of interest to the pulp and paper industry, went into effect on July 1, last. Ordinarily they would have become effective after the announcement of the new tariff in Parliament in April but were held over to meet the situation in British Columbia where deliveries around the Horn of shipments were awaited.

The Railway Commission yesterday issued an order in the case of the Esquimaux and Nanaimo Railway Company, which desired to construct a line across the railway of the Anderson Logging Company at a point between Multiple Junction and Courtenay, B.C. The Board, while authorizing the crossing, decides that an interlocking plant must be installed to prevent trains of the logging company, loaded with lumber, from running with trains of the applicant company.

The Eastern Canada Lumber and Pulp Company, a new company which was incorporated under Dominion law last year with head office in Ottawa, has not yet started business. To your correspondent, Mr. George F. Prosser, manager of the Capital Office Supply Company, who is a director of the company, stated that no attempt at organization would be made until condi-

tions prove more favorable toward this end. The company aims to do a trading business in lumber and pulp, and has no present plans for manufacturing these commodities.

Considerable interest is being taken by the trade in the project involved in the survey of the Saskatchewan River, which will be completed this autumn by the Public Works Department. The plan is to obtain a waterway from the foot of the Rockies to Winnipeg. It would be five feet deep, enough for barge traffic. The Northwest as a pulp and paper field has only lately begun to receive attention. Large districts, particularly in the valleys of rivers, are covered with good pulpwood, and there is no lack of waterpowers. Mr. L. G. Denis, chief engineer of the Conservation Commission, in an interview in this regard last week, made the statement that Canada's northern waterpowers were industrially valuable. "The existence of numerous falls and rapids in these parts is not denied," he stated, "but the argument is advanced that the temperature and other climatic conditions existing where these falls and rapids are situated, will prevent their utilization." In contradiction of this statement he cites the case of Norway, whose climatic conditions are similar to those of Canada, whose size only slightly exceeds that of the Maritime provinces, and yet which has waterpower plants with a total capacity of over 1,500,000 horsepower. With these advantages, and with the construction of the Saskatchewan barge canal and the Georgian Bay canal, the West will be in a position to take its place as a pulp and paper field.

MAC.

PAPER EXPORT.

Secretary of Commerce Redfield has announced that a special investigation of foreign markets with particular reference to the possibility of selling American paper of all classes, has been made for the Bureau of Foreign and Domestic Commerce through the American consular offices stationed in the various countries. As far as possible complete information has been obtained regarding the character and source of the paper supply, the market requirements, home production, import trade, etc., also the names of large users of paper, names of governmental departments making purchases and names of persons who might become agents for American exporters. The samples received include all weights of paper, from thinnest Japanese to coarsest ledger, and qualities from the finest bond to the cheapest wrapping and printing paper. The reports cover the entire world, except Africa.

The information is to be made available to American manufacturers in manuscript form and, following the bureau's regular practice, the reports and accompanying samples will constitute a travelling exhibit which will be displayed in various cities for examination by interested parties.

TO STUDY WOOD UTILIZATION.

Prof. H. K. Benson, of the University of Seattle, Wash., has been appointed a commercial agent in the Bureau of Foreign and Domestic Commerce by Secretary Redfield of the Department of Commerce. He will go abroad immediately to study the utilization of by-products of the lumber industry. Other representatives of the bureau will make intensive studies of possible markets for wood products of all kinds, probably in European and South American countries.

KEEPING CLOSE TAB

U. S. Wrapping Men to Get Statistics and Adopt Standards.

(Special to Pulp and Paper Magazine.)

New York, N. Y., July 12, 1914.

The Wrapping Paper division of the American Paper and Pulp Association, of which H. H. Bishop is Secretary, issued a pamphlet last week to its members outlining the purposes of that part of the association. It is the main object of the Wrapping Division to give special and closer attention to statistical details, and it is understood that the other divisions will soon follow in the footsteps of the leader. The pamphlet is quoted as follows:

The Wrapping Paper Division is a sub-division of the American Paper and Pulp Association, to membership in which any manufacturer of wrapping paper is eligible.

The American Paper and Pulp Association is an organization to membership in which every manufacturer of paper and pulp is eligible. Its objects are defined in its constitution and by-laws to be:

"To promote the welfare of the paper and pulp manufacturing industry of the United States."

In pursuance of this object the American Paper and Pulp Association has endeavored:

1. To develop statistical information about production, shipment and stock of each grade of paper and pulp.

2. To repeat, and wherever possible, to amplify statistics relating to the industry derived from government and private sources, and from special statements rendered regularly to it by the government.

3. To watch legislation on tariff, hours of labor, safety provisions, weights and measures, workmen's compensation, and all other subjects related to the industry, and to inform members concerning such matters.

4. To collect a library of the industry, consisting of private, public and government publications from every paper and pulp producing country of the world, and impart information so obtained to members when called for.

5. To keep records of the growth of the South American paper and pulp markets so far as records are available.

6. To make charts of all kinds to show graphically various conditions of great interest to the industry.

7. To undertake, wherever possible, the preparation of any sort of information requested by members, such as the investigation of power consumed, yield of pulp per cord of wood, sources of raw materials, rainfall conditions, etc.

8. To foster in every way movements towards the following:

The adoption of uniform trade customs for each grade of paper and pulp.

The adoption of uniform cost systems.

The standardization of materials and products.

The prevention of industrial accidents and adoption of safety devices.

The maintenance of fair wages.

The establishment of vocational paper and pulp training schools.

The maintenance of governmental experiment stations, like that at Wausau, Wis., for the paper and pulp industry.

9. To be, in every sense of the word, a clearing house of information for the industry in all matters in which the individual manufacturer cannot, on account of the cost, lack of time, fear of his competitors, or any other cause, do the work.

Heretofore each of its Divisions, consisting of the Cover Paper Division, Writing Paper Division, News Paper Division, Tissue Paper Division, Chemical Pulp Division, Wrapping Paper Division, Coated Board Division, Board Division, Glazed and Fancy Paper Division, etc., has been administered by one of the manufacturers, who was termed a "vice president," and who gave particular attention to the interests of the division with which he was identified.

In April, 1914, the Wrapping Paper Division at a meeting held in Chicago determined to organize in a different manner, and to give the duties, heretofore performed by the vice-president without compensation, to a paid secretary, who would devote his entire time, to the interests of this division. In accordance with that decision H. H. Bishop, of Cleveland, O., was chosen as secretary on April 20, and assumed the duties of his position immediately thereafter.

There have been two meetings held since he became secretary, a report of which was sent to you recently.

The Objects of the Wrapping Paper Division.

The Wrapping Paper Division decided at these meetings to adopt measures to achieve the following objects:

1. The establishment of a standard cost-accounting system in each mill.

2. The improvement of statistical reports by going more into detail than has been the case heretofore.

3. The filing of reports of sales with the secretary, at monthly intervals, giving the following details: (a) Quantity sold; (b) billing price; (c) freight allowance; (d) cash discount; (e) trade or tonnage discount; (f) any other concession of any character. The purpose of reporting in this form being to ascertain the price at which all paper was sold f.o.b. mill. In addition to the information in the above form, each manufacturer will be expected to name the lowest price obtained for each quality, highest price and the average price. The secretary will be expected, after receiving and compiling these reports, to give to all those who furnish them, and to them only, information covering the aggregate of reports received, showing range of price received for each kind of quality of paper, lowest price, highest price and the average price of the whole.

4. The creation of subdivisions, such as the Fibre Division, Manila Division, Kraft Division, Jute Division, etc., for the purpose of holding meetings of the manufacturers who are interested in these particular lines, and the consideration at those meetings of problems peculiar to them.

These are the activities so far determined upon. The secretary has other activities in mind to be accom-

mended and acted upon at some future date, the tendency of all of them being toward greater usefulness to the members. Some of the things in mind and which may be given as an example are:

1. Measures to standardize the product as to weight, quality, etc.

2. Measures to define ethical trade customs.

3. The discussion of relations to jobbers and brokers.

The secretary will also from time to time communicate with the members in accordance with suggestions that he may receive from any of them in regard to other proper activities.

Another function of the secretary, and very important, will be acting as arbiter of differences that may arise between individual members, investigating reports transmitted to him of unbusinesslike or unethical conduct on the part of any member, the result of which would be injury to some fellow member; the constant encouragement of confidence, good will and harmony between members.

The secretary does not pretend to have any technical knowledge of the paper industry, but does claim considerable experience in organization work, similar to that mapped out here, and it is expected that his close attention to the affairs of this division will result in benefits difficult to measure—some of them direct in their nature and others indirect, but all tending toward uplift of the industry.

BRAZIL A POSSIBLE PAPER MAKING COUNTRY.

Brazil, according to an article in the "Brazil Economique," possesses inexhaustible stores of the raw material, wood, for the manufacture of paper, besides which the country is well provided with a variety of fibres. But, as in other countries where the Government has not thought fit to interfere in time, the get-at-able growths of wood have been pretty well exhausted already, and timber at considerable distances from the ways of communication, although in such incalculable quantities, can hardly now be counted on as the basis of a great industry. Ways of communication

(railways, that is to say) must first be made before the timber or paper-pulp industry can be developed on anything like a paying scale; otherwise, the cost of transport will prove to be prohibitive. But there is other raw material that might be exploited and exported such as the bamboos, which are in plenty. They reproduce themselves with great rapidity, and offer no difficulty in respect to collection, as is the case with heavy timber, and large quantities of them grow convenient to the port of Paranaguá, where the marshy land is particularly favorable to their cultivation or propagation. On the initiative of the English Vice Consul of Curitiba, a test has been made in the use of these bamboos. One need not follow the statistics quoted in the article to show the urgent need for such an industry as paper manufacture locally. It is sufficient to say that the importation of paper materials is so large. And it must appear, as the article says, strange to the inhabitants of Brazil that foreign countries can make the manufacture pay with imported raw material if the same cannot be done in Brazil with the raw material in the country in abundant supply.

The Paraná Lumber Mill Co., Ltd., has been incorporated with a capital of \$40,000 to carry on the manufacture and trade in all kinds of wood products including pulp.

Tests as to Bleaching Qualities

By HEINZ C. LANE.

The well known fact that unbleached Sulphite pulp shows a reddish color under the influence of such oxydising agents as potassiumpermanganate, hydrogen-peroxide, potassium-bichromate, etc., can be taken as a guide to the relative bleaching qualities of such unbleached stock.

The easier bleaching a certain pulp is, in other words the lower the percentage of SO_2 was at the end of the cook, correspondingly less will be the amount of organic substances which through oxydation of the above mentioned reagents will show a red color. This means nothing else but that those organic substances become destroyed with the progress of the cooking process. Consequently from their presence—either high or low—a conclusion can be formed as to the degree of disintegration and bleaching quality of the sulphite pulp.

This fact has been proven by numerous tests with various unbleached sulphite pulps which had a wide range as to their bleaching qualities. The treatment with potassium-bichromate showed very distinct differences as to the red color on the various samples. Thus it was rather easy to classify them with reference to their bleaching qualities. These results were later on compared with an often applied bleach test and found to check up closely.

The test is made as follows:—Even quantities of the potassiumbichromate solution, about 3 to 5 cc, are poured in quick succession on the samples to be tested. This solution is composed as follows: In each litre of water there are 0.25 grams $\text{K}_2\text{Cr}_2\text{O}_7$ and 10 cc. n. l. HCl. A few seconds after the application the red color will show attaining its brightest color after about 2 to 3 minutes. With the basis of a comparative color scale the classification can be easily made. Weaker or stronger solutions with more or less hydrochloric acid will reduce the shading of the red coloring. The test itself is rather simple and takes but little time. It goes without saying that such a test can only serve as a comparative guide for the products of one and the same mill. In case of different origins of the pulp to be tested this treatment would be of no value, since it is imperative that the cooking process, the washing and all other handling of the stock be identically the same.

GERMAN PAPER EXPORTS.

A German comparative return of paper exports for the last two years show the following results:

	1912.	1913
	Tons.	Tons.
Board	292	293
Roofing board	109	105
Wrapping paper (pulp dyed)	778	849
Printing paper	552	687
Writing paper	162	180
Other kinds	392	447
Total of German paper exports	2,215	2,561
Total imports	306	292

Attention has been called to the market increase of exports in board and printing paper. In the latter, export business has been forced upon manufacturers by the unsatisfactory condition of the domestic trade. —World's Paper Trade Review.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

London, July 4, 1914.

The paper mill at Calder Grove, belonging to C. Marsden and Sons, Ltd., was the scene of a serious fire the other day, and damage estimated at \$20,000 has been done. Fortunately the fire was confined to some huge stacks of wood pulp built near the railway, which serves the mill, and several brigades of fire-fighters saved the mill. When the fire was first discovered the mill fire brigade was called out, but it was soon found out that further assistance was necessary, and this was requisitioned by telephone. Meantime, the large stacks of pulp were being enveloped in flames, and the inflammable state of the bales left the firemen practically useless, notwithstanding the fact that the mill canal was close at hand. About 3,000 bales were destroyed, and it is said that a spark from the engine on the railway caused the conflagration. It will be remembered that this time last year the same firm had a disastrous fire at their mill at Barnsley. The damage at Calder Grove has been covered by insurance.

Bury Paper-Making Co.

The half-yearly report of the Bury Papermaking Co., which owns the Gigg mill, near Bury, in Lancashire, shows a gross profit on trading of £6,752. After paying certain charges there is £3,679 left. Adding the balance brought forward from last year amounting to £14,711, there is a disposable balance of £17,850. The directors consequently recommended a dividend of 10 per cent, plus a bonus of 2½ per cent, carrying forward £14,553. The gross profit a year ago was £8,277, the dividend the same as now and the balance carried forward £13,260. It will be seen from this report that the Bury Papermaking Co. is one of the firms that has already had its trading account profits affected by the state of bad trade during the past half year, but taking things on the whole the mill has not what one might call a bad year. No doubt this is due to the good management and the excellent reputation the mill enjoys in the British paper industry.

Altering Stokers.

A unique alteration to stokers has been recently effected at the Ingress Abbey Paper Mill belonging to the Wall Paper Manufacturers, Ltd., at Greenhithe. The work was carried out by Edward Bennis and Co., Ltd., of Lancashire, and it shows four Bennis grate links fitted to frames of another make. Edward Bennis and Co. were requested to re-link one of the existing grates with their long-life patent link and to guarantee to burn 25 lb. of coal per square foot of grate per hour with a reasonably good draught, and to obtain from 11 per cent to 12 per cent CO₂. The coal to be used is a good rough small coal, and the combustion is to take place without burning the links. The guarantee has been easily fulfilled, with the result that Messrs. Bennis have now received orders to re-link the other three additional grates.

Labor reinvances.

Sometime ago the government offices were given instructions that in all contracts it was to be stated that the contractor must pay workers a fair wage, according to what Trade Unions recognised as a fair wage, and this clause in the contracts entered into has prompted

the National Union of Paper Workers to instruct the Secretary to the Treasury if he was aware that A. Cowan & Sons, Penicuik; the Ilford Paper Mills Co., Ilford; T. H. Saunders & Co., High Wycombe; J. Allen & Sons, Ivybridge; Reed and Smith, Cullompton; J. Cropper & Co., Kendal; R. Fletcher & Son, Stoneclough; and C. T. Hook & Co., Snodland in Kent, were not observing the fair wages clause, and if he would have inquiries made into the matter and in the course of the investigations receive a deputation from the National Union of Paper Workers. He was also asked if he was aware that R. Somerville & Co., of Creech Mill, near Taunton, paid the lowest wages of any firm in the British paper trade; that the rate paid to general workers is 11s. 6d. about \$2.76 per week; that the day-shift men work 72 hours and the night-shift men 68 hours per week; that other firms in the South of England pay \$6 per week for shifts of 66 day and 60 night. A reply to those questions has been given by the Secretary to the Treasury, who says that inquiries will be made into the questions raised and that representations may be sent from the national Union of Paper Workers. The results will be awaited with interest.

Mill Improvements.

The new mill at Maidstone for Messrs. A. E. Reed & Co., is gradually drawing to a completion and when finished so far as the machinery is concerned—which the owners are now engaged in installing—it will be the most modern concern in England in the paper trade. The output of all the Reed mills at present is about 1,100 tons of paper per week and the mill is to be worked by electricity. Messrs. Calder & Co., of Inverkeithing, one of the Scotch mills, is also at work and the new buildings erected constitute an imposing sight from an architectural point of view, whilst inside the most modern machinery has been erected. The Imperial Paper Mills at Gravesend, have just installed shifting and cooling machines for 90 inches of paper. This makes the sixth installation at these mills to take up to 114 in. webs, and to reel from 9-inch wide and upwards. The Imperial Mills are reckoned to be—or at least will eventually be—the largest in the United Kingdom, as the plans originally laid down and worked out are on an extensive scale, so much so that other paper mill owners in the north and south of England eye become somewhat nervous of the things contemplated.

An interesting test case is shortly coming before the Railway and Canal Commission Court in London, in which Messrs. Smith, Stone and Knight, Ltd., paper merchants of Birmingham and Bristol, are to appeal against the high tariffs of the railways. They spend no less than \$57,600 a year on railway transit and an application has now been made to the court to make the various railway companies disintegrate certain rates they have enforced on the paper merchants. The court has ordered the companies to do so, and naturally this will entail an enormous amount of work and expense which the railways will not like. The case is a very important one and the British Paper Makers' Association, financially and otherwise, are giving Messrs. Smith, Stone & Knight, Ltd., a helping hand in

There came an action of which the Canadian Pulp and Paper Association might take note.

Mine Discovered.

Mr. E. P. Morris in the course of an article in "The Britannic Review" states that the Anglo-Newfoundland Company, of London, who own the paper mills at Grand Falls, some time ago came upon what promised to be a very excellent mine, through one of their surveyors picking up a piece of ore-bearing rock in the woods. The locality proved to contain a complex ore body consisting of lead and silver, and covered with a little gold. They have sunk a shaft on it for 300 feet, and found a bed of ore 9 feet wide with a mineral line in lenses. As they were hurrying over work at Grand Falls operations have been suspended for the time being. The company have also large farms which they are turning to great use and employ over 100 horses in the woods every winter. The Anglo-Newfoundland Company, in which Lord Northcliffe is largely interested, supplies paper to the "Daily Mail," the "Evening News," "Times," and other large London daily and weekly papers, in addition to several of the monthly magazines.

Paper Man Honored.

Canadians will be interested to learn that the Lord Mayor of London (Sir T. Vansittart Bowater, head of the firm of Bowater & Sons, Ltd., paper makers and agents, London), who sent through the Pulp & Paper Magazine London correspondent a very kindly message to Canadian Pulp and Paper men on the occasion of his accession to the Mayoralty, has been raised to a baronetcy of the United Kingdom by King George V. The honor is a very distinguished one, and is given for Sir Vansittart's services in entertaining the King and Queen of Denmark in London some weeks ago. Mr. Rainald Bowater, who is now secretary to Bowater and Sons, Ltd., becomes heir to the title and curiously enough, it was only the other day that Mr. Rainald was married. The wedding was a very fashionable one and was largely attended by pulp and paper men.

Excess Fibre.

I have been favored with a copy of the report of the Swedish Chamber of Commerce in London, and I see that when cellulose makers supply an excess of fibre under a stipulated contract, it is customary to charge for the excess, when such had been found as a result of analyses, and also to charge for the cost of analyses when the test is made at the instance of the buyer. This question has been settled by the British Wood Pulp Association, and it is a point that the Canadian Pulp and Paper Association might look into, if they have not already done so.

A Canadian Order for England.

Messrs. J. Marx and Co., Emsbury Pavement, London, have received an order from the Beigo-Canadian Pulp and Paper Co. to supply two crystalline stone wet press rolls for the 220-inch machine that Charles Watrous and Co., the papermakers' engineers, of England, are building at the Shawinigan Falls mill. The weight of the stone wet press rolls is 9 tons each, and it is a special kind of stone that Messrs. Marx use that make these rolls so popular in most of the up-to-date mills.

The Ontario Government is purchasing titles to timberland in the Adirondack Park, with a view to securing Government's free title and an increase in revenue for the Province. From the Mass. Lumber Company 350 square miles within the park were purchased for \$290,000.

British-Canadian Trade-Exports of Paper to Canada and Canadian Exports to United Kingdom

(By Our London Representative).

London, July 2, 1914.

I have received from the British Trade Board, statistics of the paper trade between the United Kingdom and Canada, and other British possessions, in addition to foreign countries. These statistics are usually issued each year about this time and they cover a period of five years back counting from the end of 1913. For the information of pulp and paper men who study my notes each month in the "Pulp and Paper Magazine," I desire to point out that these statistics may be taken as fairly accurate—not absolutely—and they give a good indication of how Canadian trade is progressing in the British markets. I only repeat what has already been stated in the British Trade News appearing in the Pulp and Paper Magazine from time to time, viz., more of the British trade should be captured by pulp and paper men in the Dominion, and when the prices are on the same basis as the Scandinavian prices, Canadians will undoubtedly get precedence above any other manufacturers. If personal attention cannot be given to the market, agents should be prevailed upon to give the British trade greater attention and secure more of the pulp contracts—most valuable ones these are sometimes—and newsprint orders that are constantly being handed over to other sources.

The total imports of paper of all kinds, boards, playing cards, paper bags, envelopes, etc., reached £7,674,419 £1 equals about \$4.80 or \$4.82 an increase of £439,982 over 1912, and an increase of £2,026,982 when compared with 1909. Of these imports the following shows the supplies received from Canada and Newfoundland:

		Paper on Reels.	
1912	1912	1913	1913
Cwts.	£	Cwts.	£
790,653	394,764	860,123	428,066

These figures only relate to Newfoundland. But the largest supplies came from Norway with Sweden and Germany next, the totals amounting to 2,628,869 cwts. valued at £1,466,509, compared with 2,657,153 cwts. in 1912, valued at £1,451,095.

Printing and Writing Paper Not on Reels.

The total reached 1,002,193 cwts. valued at £877,423, as against 926,379 cwts. valued at £836,468 in 1912. The supplies from Canada are:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
171,982	84,397	1,873	1,092	766	479

Norway, Germany and Sweden and Belgium are the biggest suppliers in the order mentioned.

Paper Hangings.

The imports are valued at £272,130 for 102,948 cwts. compared with 110,342 cwts. at £253,962 in 1912. No supplies from Canada are recorded and the same remarks apply to packing and wrapping paper which reached 4,090,296 cwts. at £2,847,238 in 1913, as against 3,775,006 cwts. at £2,886,027 in 1912. Strawboard was imported to the extent of 3,500,432 cwts. at £978,431, as against 3,285,011 cwts. at £898,259 in 1912. The Newfoundland supply most of the strawboards.

Boards.

Millboards and wood pulp board were received to the extent of 1,312,682 cwts. at £634,047 in 1912 and in 1913 these imports rose to 1,319,078 cwts. at £665,977. The supplies from Canada were:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
125,924	56,948	213,982	94,480	222,615	104,161

To manufacturers of boards in Canada these figures are gratifying, but it must be remembered that Finland, Sweden and Germany are keen competitors in the boards. Therefore, the Canadian trade should be well nurtured and watched.

The remaining imports are made up of boxes and cartons of paper, card board and unenumerated classes of paper in which Canadian figures are not given:

The exports of the British mills to British possessions and foreign countries reached £3,679,195, an increase of £119,878 over 1912 and an increase of £1,119,824 over 1909. The total exports of paper, boards, etc., to Canada were:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
107,337	169,164	178,067	266,763	172,158	265,635

Writing Paper.

Writing paper was exported to the extent of 218,476 cwts. at £476,286, compared with 217,444 cwts. at £469,504 in 1912. The exports to Canada were:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
9,231	20,670	5,960	16,646	6,646	15,413

Printing Paper.

Printing paper was exported to the extent of 1,871,721 cwts. at £1,823,163, compared with 1,782,504 cwts. in £1,746,141. Canada took the following supplies:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
72,315	91,914	121,948	147,018	121,649	150,763

Packing and Wrapping Papers.

The supplies to all countries are valued at £379,682 (390,452 cwts.) as compared with \$48,396 cwts. at £347,356 in 1912. The supplies to Canada were:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
11,962	17,846	20,285	30,896	18,193	29,594

Coated Paper.

Coated papers were exported to all countries to the extent of 27,994 cwts. valued at £128,397, compared with 34,045 cwts. at £148,091 in 1912. Canada was supplied as follows:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
716	1,873	1,661	4,626	1,354	4,444

Paste and Millboards.

For the year 1913 the exports were 125,211 cwts. at £116,618, compared with 110,291 cwts. at £103,044 in 1912. To Canada the British mills sent:

1909	1909	1912	1912	1913	1913
Cwts.	£	Cwts.	£	Cwts.	£
2,424	3,061	3,865	4,049	2,440	2,144

Manufacturers of Paste and Millboards.

Out of the export trade of 10,875 cwts. at £26,659 (compared with 9,547 cwts. £21,352 in 1912) Canada took 423 cwts. at £1,715 in 1913; 1,197 cwts. at £2,493 in 1912 and 2,181 cwts. at £5,249 in 1909.

The total trade with foreign countries reached in 1913 £1,399,007 (compared with £6,698,813 in 1912) and with British possessions £569,570 (as against £535,624 in 1912).

Annual Consumption of Wood by the Manufacturing Industries in the United States

Statistics have been compiled by the U.S. Forest Service which show for the first time precisely how the lumber produced in this country is utilized. About 45 billion feet of lumber of all kinds is the annual production in the United States; of this nearly twenty-five billion feet, board measure, are further manufactured, the other portion remaining for rough construction lumber and for similar purposes. This is exclusive of material which reaches its final use in the form of fuel railroad ties, posts, poles, pulpwood, cooperage, wood distillates and the barks and extracts demanded by the tanning industry.

The work of collecting and compiling the figures extended over a considerable period and was carried out state by state, but as one full year was made the basis of statistics in each state, the total is a fair average of the use of lumber in further manufacture in the whole country, between 50 and 60 per cent of the lumber produced is subject to further manufacture. In preparing the figures in this way, however, it should be remembered that considerable material reaches shops and factories in the form of logs, bolts and billets without having passed through saw mills; and while this material is included in these statistics this fact should be remembered in comparing the statistics with those of lumber production.

Nearly or quite 100 different woods are used in this country under their own names, while an unknown number find their way to shops and factories without being identified, or separately listed, except under general names. In quantity the soft woods, the needle-leaf or coniferous trees, are most important, but there are a greater number of species among the hardwoods, or broad-leaf trees. Yellow pine comes first with more than eight billion feet, followed by white pine with three billion, and Douglas fir with a little more than two billion. It should be understood, however, that the term "yellow pine" includes several species, the three most important of which are longleaf, shortleaf and loblolly. Oak, including all species, has nearly two billion feet, and is the most important hardwood. Maple comes next.

Dogwood comes about halfway down the list with more than seven million board feet, and of those species mentioned Turkish boxwood comes last with less than thirty thousand feet, followed by many others too insignificant to list, but making a total of all kinds of more than a million feet. Of the native species, laurel, holly and yucca fall very near the foot of the list in relative quantities used.

Fifty-five principal industries use wood as raw material. Their relative importance is hard to indicate, because quantity alone is not in all cases a criterion of value of an industry to the community in which it is situated, nor to the country as a whole.

More than one-half of the total consumption consists of planing mill products, the largest items of which are flooring, siding, ceiling and finishing. The next industry, in point of quantity of wood used, is the manufacture of boxes and crates. Nearly four times as much wood is demanded by makers of boxes and crates as by the builders of steam and electric cars, which come next, and five-fold the amount that goes into furniture, which in turn leads vehicle manufacture.

novelties and supplies for dairymen, poultry keepers and apurists, and just before handles and musical instruments. About midway down the list comes pumps and wood pipes. Among the products important enough to list separately are canes and umbrella sticks, brooms, firearms, artificial limbs and tobacco pipes.

The apportionment of wood among the various industries, grades from planing mill products, which take most, down to aeroplanes and dry kilns, at the bottom of the list.

TREATMENT AND APPLICATION OF BOILER FEED WATER.

The chief care of boiler owners is the supply of the boiler plant with the necessary water of proper condition. Rain-water is the best of the natural waters. In a descending series of quality we may mention, apart from particular exceptions, the water of rivers, ponds, brooks, springs and wells. The latter one although of clear aspect contains mostly plaster, chalk and salts of magnesia, which make themselves noticeable in the boiler scale deposits.

Original impurities as clay, sand, etc., which can, especially with a lack of filtration apparatuses, get to the boiler, accumulate there very easily. There are removed in the best manner as follows: The boiler is highly fed and the mud blown off by repeated opening and closing of the blow-off valve, till the normal level of water has been attained.

Before putting the boiler out of service it ought to be cooled completely. Thus burning or eaking of the mud is avoided, and this can be removed for the greater part by syringing.

There will be more damage to a boiler than advantage if scale of small thickness to about 0.5 mm is removed. Scale of greater thickness is to be removed by knocking off or boring out, avoiding sharp tools.

If the steam is to be used only for power generation, the interior boiler walls can be painted with a mixture of linseed oil and graphite coal tar and graphite. During the last three days before putting the boiler out of service a small amount of petrol can be fed in. This also prevents the sticking of the scale. When using this method it is necessary to take precaution after opening the boiler on account of fire-risk.

The most economical method is the previous removal of the materials which form the scale by adding quicklime, soda, caustic soda or several of these remedies. It is above all necessary to examine the water thoroughly, before reverting to one or another of these remedies and fixing the amount of it. Therefore universal remedies bearing high-sounding names are of no value.

If with smaller plants without special refining plant soda is fed into the boiler, the reaction of the water in the boiler ought to be observed and by repeated partial or entire letting off of the mud an accumulating of soda in the boiler must be avoided. Otherwise packing fittings, boiler walls and riveting seams will be affected.

Whilst the scale-formers damage mostly indirectly by raising the fuel costs, fats produced from oil from waste steam, and also an and carbonic acid will directly affect the boiler walls. Fats ought to be retained in the waste steam drum by oil separators. Air and carbonic acid exists in nearly all natural waters and can do harm only in such cases, where they cannot get away with the steam after their getting free in the boiler. By pre-heating of the feed water to about 80° C. the greater part of air and carbonic acid will be

driven out, so that these can be separated before entering the boiler by desairation-appliances. The form of the feed-pipe is also of importance. This ought to be mounted into the boiler beneath the lowest water level horizontally and contain lateral holes or slits. The end of the pipe ought to be tapped. By this the water is prevented from flowing in thick streams against the wall of the boiler, on the other hand, the feed water before discharge will be preheated considerably within the feed pipe, so that the free gases can escape at once.

If the holes or slits of the feed-pipe become easily obstructed, the pipe with tapped or closed end can be slitted in its whole length. In such cases, where tapping or closing of the pipe is not practicable, an impact sheet ought to be mounted at some distance from the pipe-end. One or the other of these remedies will be applicable in every case.

SUMMER WEATHER AND PAPERMAKING.

When the hot season of the year begins the paper-maker is confronted with various difficulties, and the Papier-Fabrikant makes reference to the following:—

In open water-courses the algae begin to develop greatly, and these readily pass into the water pipe and stop up the shower pipes. The simplest means to remedy this is to cover all channels and tanks exposed to sunshine.

Cellulose makers notice an undesired increase in the formation of plaster of Paris in the limestone towers and a diminution of free sulphurous acid in the liquor. It is preferable to cool the gas pipes well by means of shower pipes and to diminish the whitening of the outside walls of all liquor tanks and absorption towers with milk of lime, in order to diminish the capacity of absorbing heat and to obtain as low a temperature as possible.

Chloride of lime should be stored in a cool place, protected from the sun and rain.

The rosin casks should also be stored in the shade in order to prevent the rosin flowing. Showers of rain, which together with heat and light, soon render the rosin non-transparent and non-saponifiable, and are also particularly injurious.

Rolls of paper moistened on the paper machine readily dry at the edges and form folds. The moistened rolls should therefore be stored in a cool room on beams about 15 cms high. The floor should be kept moist in order to prevent drying.

The windows of the sorting room and of the paper stores on the sunny side should be painted on the inside with Spanish white to which a little ultramarine blue is added.

For purifying the waste water it is preferable to add lime.

Coating baths made with animal size readily become acid from one day to the next. This can be prevented by neutralising the fresh coating mass with sodium carbonate, an addition of 150 g. zinc sulphate per 100 kg. coating mass is still better for preventing the fermentation.

For tarring and packing paper the following bath is 45 kg. rosin oil, 25 kg. In order that it may dry as generally used. Dry tar, 250 kg., Norwegian tar, once in summer without smearing having to be feared, the admixture of dry tar should be increased as the temperature of the air increases.

Lastly, it is necessary to carefully control the percentage of moisture of all raw materials entering the mill.



NEW PATENTS



DOUBLE-FACED CORRUGATED PAPER-BOARD AND METHOD OF MAKING THE SAME.

Jeffrey T. Ferres, Inventor.

The invention relates to paper board of double faced corrugated character and the object thereof is to produce a novel and efficient board of this kind and to provide a new and useful method of making the same.

Speaking in general terms, the new board comprises two facing strips and two interposed corrugated strips having their crowns opposed and secured to each other and the method of making such board consists in applying an adhesive to the crowns of the corrugations of two sheets of single faced boards and bringing such sheets together with their crowns in contact.

In the drawing, Figure 1 is a perspective view illustrating the new construction of board; Fig. 2 a plan view of the board during its process of manufacture; Fig. 3 a cross section of the board illustrating a step

2 interposed between the facing strips. Each corrugated strip is secured by an adhesive to its facing strip and the opposing crowns of these corrugated strips are in contact with each other and are secured together by an adhesive indicated at 3.

Describing the preferred method of making this new board, take a sheet of single faced corrugated paper board of any desired or suitable dimensions and slit it in half by means of the slit indicated at 4 in portion of the crowns of these corrugations as indicated at 5. The two half sheets or sections thus produced are then turned or reversed upon each other with the corrugations intermediate, the unslitted portions 5 acting as hinges and also holding the two sections in proper relationship as shown in Fig. 3, with the result that when the two sections or sheets are completely brought together as seen in Fig. 4 the crowns of the opposing corrugations will be in contact with each other with accuracy along their entire length. After the sheet has been slitted in the manner explained and before the two sections or half sheets are folded over, the sheet is passed through a suitable machine of any well-known character for applying paste to the crowns of the corrugations so that when the two sections are folded together as already described the crowns which are in contact will be secured together as at 3. In this manner the completed board is made with the greatest accuracy and uniformity, the proper positioning of registering of the opposing crowns and their securing together being assured.

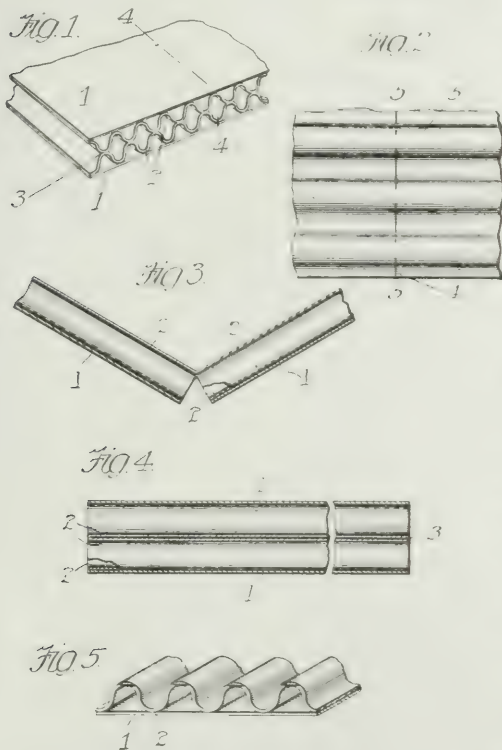
The machine for making the paper is described as follows:

My invention relates to a machine for making corrugated paper and the object thereof is to provide a machine of this general character adapted to corrugate a plurality of sheets simultaneously and to apply to one or more of the sheets before being corrugated a series of strips of adhesive, in order to produce a corrugated board which is stronger than the usual board but yet capable of being properly scored and bent for box construction.

The machine is also adapted to apply a facing sheet or sheets to the corrugated paper board produced in the manner explained.

In the drawings Figure 1 is an elevation of the upper portion of a machine illustrating my invention; Fig. 2 a sectional plan on the line 2-2 of Fig. 1; and Fig. 3 a detailed view on an enlarged scale of the adhesive applying roll.

Referring to the present embodiment of the invention as illustrated in the drawings, the machine has a main frame including the opposite side pieces or frames 1 which support the various working parts of the machine. These side frames are provided with vertical openings or slots 1a within which are arranged the bearing boxes 2-2 of the upper and lower corrugating rolls 3 and 4 between which the paper is corrugated. Below the lowermost roll 4 is a plain roll 5 whose bearing box 6 is vertically movable or adjustable in the opening 1a like the other boxes, the box 6 being vertically adjustable by any suitable means such as the adjusting screw 7 whose upper end is illustrated in Fig. 1. The uppermost box 2 is adjustable by means of the



in the process or method of manufacture; Fig. 4 a section on the line 4-4 of Fig. 1 illustrating the completed board and Fig. 5 a section on the line 5-5 of Fig. 2.

Referring to the present embodiment of the invention as illustrated in the drawings, the board comprises the two facing strips 1, 1 and the two corrugated strips 2,

screws 8 whose lower ends engage said box and whose upper ends are screw threaded through a horizontal cross bar 9 secured to the tops of the side frames 1.

The main frame carries at its upper end, in the present instance by means of the brackets 10 and 11, the rolls of paper 12 and 13. A sheet or strip of paper A from the roll 12 passes over the idler roller 14 and around and under two idler rollers 15 and 16 and thence between the two corrugating rolls 3 and 4, the paper when corrugated then passing between the lowermost roll 4 and the plain roll 5 and being delivered from the machine at this point. The roller 14 is preferably adjustable in suitable manner as by means of the supporting slides 17 which are adjustable in the end frames 1 and secured in place by means of the bolts 18. A sheet or strip of paper B from the other roll 13 passes downwardly and around the two idler rolls 19 and 20 and thence upwardly between the two corrugating rolls where it meets the other sheet A. The two sheets or

Consequently the adhesive, instead of being applied over the entire surface of the sheet A, is applied in a series of parallel lines extending in the direction of the line of movement of the sheet. The adhesive is applied to the sheet A before it is introduced between the corrugating coils 3 and 4 so that the corrugating of the two sheets and the pressing of the same together in order that they may adhere are done at one and the same time between the corrugating rolls 3 and 4 and around the lowermost roll 4 and between such latter roll and the plain roll 5. Furthermore the corrugated board thus produced is held in contact with the lower corrugating roll 4 by means of the rods or wires 24. The proper amount of adhesive carried by the roll 23 is regulated by the adjustable scraper 25 and the amount of the adhesive applied to the sheet A is determined by the width of the circumferential grooves in the adhesive roll and consequently the number and width of the adhesive applying surface 23a.

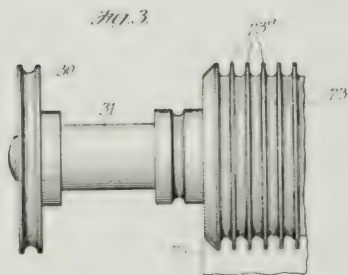
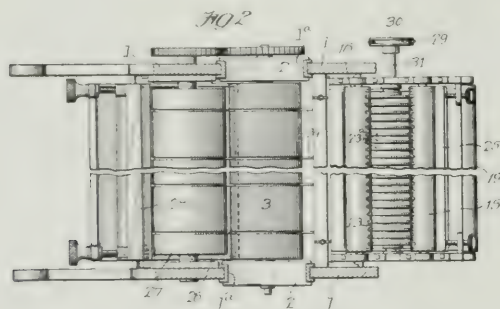
While the machine just described is capable of producing a corrugated board composed of two corrugated sheets, it is evident that three or more sheets can be united as well as the two by simply using additional adhesive applying rolls and additional sheets of paper.

The board produced by means of the machine as thus far described is a corrugated board of the plain or unlined type and used for different purposes. If it is desired to apply a liner or facing strip or strips to this corrugated board, additional paste applying mechanism or mechanisms are incorporated in the machine. For instance, I have shown in the present machine a second adhesive applying mechanism comprising the pan 26 adapted to contain the adhesive, the adhesive applying roll 27, and adjustable scraper 2, the same being mounted and arranged between the side frames. The roll 27 preferably positively actuated is in a position to apply the adhesive to the outer crowns of the corrugated board as it is being carried around by the lowermost corrugating roll 4. The facing or lining sheet or strip which is shown at C comes from a suitable roll (not shown) and passes upwardly over the plain roll 5 and there meets the corrugated board, whose crowns have been supplied with the adhesive in the manner just explained with the result that the single facing corrugated board shown at D is produced. In case it is desired to produce merely the corrugated board, the adhesive roll 27 is backed off from its operative position shown, for which purpose the mountings or bearings of this adhesive mechanism are made adjustable in the side frames as shown.

By preference and as herein shown, the adhesive roll 23 is positively actuated. It may be driven in any suitable manner and as shown it is driven by means of the cross belt 29 extending over the pulley 30 on extended shaft 31 of said roll and over the roller 14 which is itself positively driven in any suitable manner. It will also be understood that the corrugating rolls 3 and 4 and the plain roll 5 are suitably driven, but as the driving connections for such rolls are so common the same have not been illustrated.

As shown and by preference, the scraper 25 is adapted to fit the raised and depressed surfaces of the adhesive roll 23.

The Inland Timber and Construction Co., Limited, with headquarters in Winnipeg, and a capital stock of one million dollars, has been granted a charter. Among the directors are P. E. Henderson, E. A. Conde, F. E. Taylor and J. A. Ptolemy.



strips of paper A and B are thus simultaneously corrugated and they are at the same time caused to adhere by the adhesive applied to the sheet A in a manner now to be described.

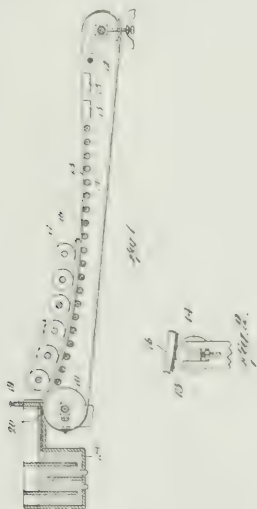
The pan 21 which contains the adhesive is mounted between the side frames 1 upon the ledges or shelves 22 of said frames and in such a position that the adhesive roll 23 will dip therinto and supply adhesive to the sheet A as it passes underneath the idler rollers 15 and 16 whose rollers are so arranged as shown in Fig. 1 that such sheet will be brought into proper contact with the adhesive roll. This roll is of the peculiar construction illustrated in detail in Figs. 2 and 3, the same being circumferentially grooved so as to provide a series of adhesive applying surfaces 23a

METHOD AND APPARATUS FOR MAKING PAPER.

Leonard B. Buchanan, Woburn, Massachusetts,
Patentee.

No. 1,101,725—Patented June 30, 1914.

This invention relates to Fourdrinier machines, and has for its object to construct and arrange a paper making wire and its supports whereby the stock is caused to travel by gravity in the direction of movement of the making-wire, so as to attain quickly a velocity equal to the speed of said wire, and then to travel with the wire, aiming to produce a uniform sheet of paper which is strong, even and well-formed. Heretofore an attempt has been made to accomplish this result by raising the breast-roll to such a height that the downwardly moving paper-making wire has considerable pitch throughout its length, causing the stock to travel by gravity, so as to attain a velocity equal to the speed of the wire, but as the pitch continues throughout the length of the wire the stock continues to be affected by gravity throughout the length of the wire and hence moves in advance of the wire, and were it not for the fact that the stock settles on the wire as the water leaves it, so



that its advancing movement relative to the wire is retarded to a considerable extent, no efficient result would be obtained, but as it is, however, the disadvantage due to gravity at the guide-roll end-portion of the wire is more than offset by the advantage gained by gravity at the breast-roll end-portion of the wire, so that on the whole a result is obtained which is a distinct advantage, although the real result sought is not obtained. The angle of the wire really is a compromise, as it does not have a sufficient pitch at the guide-roll end-portion.

I have discovered that it is possible to arrange a paper-making wire, so that it shall have a very steep pitch in front of the breast-roll to cause the stock to move by gravity with considerable velocity, thereby to quickly attain a velocity equal to the speed of the wire, said pitch gradually becoming less steep as the stock gradually attains a velocity equal to the speed

of the wire until it disappears or substantially disappears, and the stock is then caused to proceed by and with the wire and at a velocity equal to the speed of the wire throughout the remaining portion of the wire.

In carrying out my invention the breast roll is positively driven instead of the guide-roll and that portion of the wire which extends along the under side of said rolls is held taut by the drive, and that portion of the wire which extends along the upper side of said rolls is held slack, thus being deflected below a plane tangential to the breast-roll and guide-roll. The slack portion of the wire is employed as the stock-carrying portion, and the angle or pitch at different portions of the slack portion of the wire may be regulated by a novel arrangement of the table-rolls whereby it shall have a very steep pitch in front of the breast roll, which gradually becomes less and less steep until it reaches a level or any desired angle with respect to a horizontal plane. By thus arranging the wire the stock which passes from the flow-box is moved by gravity at a rapidly increasing velocity, thereby to quickly attain a velocity equal to the speed of the wire, and then its acceleration due to gravitation is gradually diminished as motion is imparted to it by the wire until it is moved solely by the wire, and consequently at the same rate of speed, and as a result the fibers are permitted to settle uniformly on the wire as the water leaves the stock. This result cannot be accomplished by a continuous downwardly moving wire.

Figure 1 is a side elevation of a portion of a Fourdrinier machine illustrating one embodiment of my invention, and Fig. 2 is a detail of an adjusting-means for one of the table-rolls.

10 represents the breast-roll, 12 the guide-roll; 13 the paper-making wire; 14 the table-rolls; 15 the suction-boxes; 16 the deekle, 17 the rolls engaging the deekle for holding it in engagement with the wire; 18 the flow box, 19 the shoe, and 20 the apron, and all of these parts, separately considered, may be constructed in any usual manner, the invention residing particularly in their association and arrangement whereby a new and useful result is produced.

As here shown the paper-making wire 13 is arranged on the breast-roll and guide-roll with its stock-carrying portion between said rolls deflected below a plane tangential to said rolls. This deflection may be obtained easily by driving the breast-roll positively instead of the guide-roll, and causing the portion of the wire below said rolls to be held taut and the portion thereof above said rolls to be held slack. Said rolls may be supported by any suitable forms of adjustable bearings to admit of varying the extent of the deflection. The table-rolls are supported by bearings, which are or may be vertically adjusted, and said rolls are arranged in a novel manner, so that the deflected portion of the wire is regulated to provide for the accomplishment of the desired result. Said deflected portion of the wire is supported by the table-rolls in such manner as to form a curved plane in front of the breast roll, concave upward, whereby a very steep pitch is produced directly in front of the breast roll which gradually becomes less and less steep, while the remaining portion of the wire is supported in a horizontal plane or at any desired angle with respect to a horizontal plane, inclining downward or upward. As the stock passes from the usual flow-box it flows down the steep declining portion of the wire at a rapidly increasing velocity, thereby quickly attaining a velocity equal to the speed of the wire, and then its velocity due to gravitation, is grad-

nally diminished as motion is imparted to it by the wire until acceleration due to gravitation ceases, or substantially ceases, whereupon the stock is then caused to travel with and by the wire and at the same rate of speed. By thus arranging the wire the waves and ripples formed on wire in front of the breast roll quickly subside and the fibers are permitted or caused to settle uniformly on the wire, thus fixing the formation of the sheet in a novel manner.

I claim:—

1. In a Fourdrinier machine, the combination with a positively driven breast roll, the side-roll and the runner-making wire passing over said rolls, whereby that portion of said wire which passes over the upper sides of said rolls is held slack and is deflected below a plane tangent to said rolls, and is arranged with a steep pitch in front of the breast roll which gradually becomes less steep, table-rolls arranged to support said deflected portion of wire and a guide arranged for co-operation with said deflected portion of the wire, substantially as described.

2. In a Fourdrinier machine, a runner-making wire having its stock carrying portion arranged with a steep pitch in front of the breast roll which gradually becomes less steep thereby to cause the stock to move by gravity at a rapidly increasing velocity to attain quickly a velocity equal to the speed of the wire and then to move with the wire at the same rate of speed, substantially as described.

3. In a Fourdrinier machine, a runner-making wire passing over a breast roll and a side-roll and deflected below a plane tangent to said rolls, and table-rolls arranged to support the end-portion of the wire in front of the breast roll with a steep pitch which gradually becomes less steep thereby to cause the stock to move by gravity at a rapidly increasing velocity until it attains a velocity equal to the speed of the wire and then to reduce its accelerating force as motion is imparted to the stock by the wire, and to support the remainder of the deflected portion in a plane whereby motion is imparted to the stock by the wire, substantially as described.

4. In a Fourdrinier machine, a runner-making wire having its portion in front of the breast roll arranged in a curved plane, convex upward, and of such shape that the force of gravity acts upon the moving stock and accelerates it the greatest near the breast roll and gradually diminishes to nil when the stock attains a velocity equal to the speed of the wire, which is within a distance substantially less than the effective length of the wire, whereby permitting the stock to proceed without aid from the wire, substantially as described.

5. In the art of making paper, the process herein described of fixing the formation of a sheet on the paper-making wire, which consists in causing the stock to move forward at a rapidly increasing velocity until it attains a velocity equal to the speed of the wire and then to continue at a velocity equal to the speed of the wire, so that the fibers are permitted to settle uniformly on the wire.

6. In the art of making paper, the process herein described of fixing the formation of a sheet on the paper-making wire which consists in causing the stock to move forward by gravity at a rapidly increasing velocity until it attains a velocity equal to the speed of the wire and then gradually reducing the accelerating force until its acceleration due to gravitation ceases and then moving it at a velocity equal to the speed of the wire.

The Life of Wires

The wear of the wire must be considered abnormal not only when many tires are used, but also when the wires have to be mended too early, but nevertheless remain the usual time in the machine.

How long a wire should last can never be stated generally, says the "Papier-Fabrikant." It depends on whether the machine runs quickly or slowly, whether thick boards or thin papers are made, whether it is an old or a new machine, etc. In one mill fine paper was made at a speed of 40m., and the wires ran for five weeks. After increasing the speed to 60m. the wires

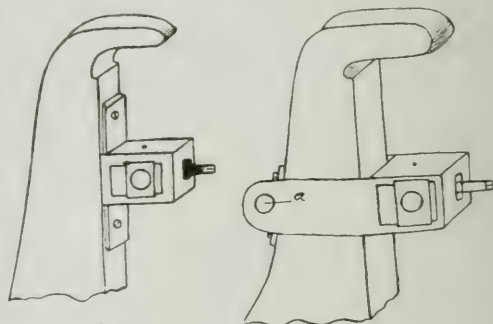


Fig. 1

Fig. 2.

ran only three and a half to four weeks. This shorter life was natural because although the quality was the same an increased quantity was produced. Forcefully driving an already well used wire merely had the effect of rendering completely illusory the initial high output owing to the many stoppages necessary during the last weeks. The consumption of wire was thus normal. In another case an abnormal consumption of wire was met with.

The paper machine in question made in the year 1898 worked up on an average 180,000 kg. with a working width of 140 to 180 cms. and a speed of 20 to 50 m. with one wire in five to six weeks. This is a normal performance of the wire. After some time tears were suddenly seen in the wire on the fourth day, and these spread so rapidly that the wire was unusable after a week. Every thing was done in order to discover the fault, bad bearings and defective tensioning devices were reviewed, but without success. A new wire was wanted every week.

At last the defect was found in the coupler. The upper coupler bearing was constructed as shown in Fig. 1. The trunnion bearing was adjustable horizontally and in addition was guided vertically through a slot. Owing to this guide being worn the bearing was forced away laterally. Rust and pulp fibres which had settled prevented the vertical displacement of the entire bearing, and the coupler roll was pressed slantwise on the lower roll. Too great wear of the wire was caused in this manner. New bearings according to Fig. 2 were made. The horizontal displacement of the old bearing was retained, but the vertical displacement was substituted by a rotatable bearing. This yields to the slight oil pressure and cannot jam. After this bearing was erected the wear of the wire became normal again.

Progress in the Manufacture of Sulphite Cellulose

It is recently reported that at the last General meeting of the Society of Chemical Pulp and Paper Chemists, Director Walter Sembritzki of Voitsberg in Steiermark read a paper on "Progress in the Manufacture of Sulphite Cellulose" in continuation of his communications in the year 1909.

A graphic description was given of everything new and worth knowing which had been done during recent years in the art of making sulphite cellulose; the information was closely connected with the manufacturing operation, so that it was easy to follow the interesting paper.

It is to be emphasized that at the present day a consumption of only 19-21 kg. fine pyrites per 100 kg. chemical pulp is reckoned as compared with larger pieces of pyrites in quantities of 50 kg. formerly. The difference is for the most part due to the new system of kiln and mode of working.

When comparing mills which work with sulphur with those which work their plant with fine pyrites it is found that the latter have a saving which amounts to 170,000 Marks per annum in the case of a 100 ton plant. This is rather too small if anything, for the consumption of sulphur is frequently higher.

Instead of the wooden towers armoured with large wooden scaffolds and anchors, one sees masonry towers surrounded by strong iron scaffolds.

Centrifugal pumps have superseded the old piston pumps for all purposes.

Supplying chemical-pulp digesters with steam of low pressure has proved better in every respect than reducing the pressure of high-pressure steam.

Suction draught plants or smokestacks! This is a matter of dispute. At any rate one must examine each case on its own merits as to which plant is the more suitable.

At present not much direct use can be made of turbine steam for digesting. The tests are not yet concluded. In any case it is more economical to be able rationally to use the pressure in the turbine and then the temperature of the same steam in the digester.

The endeavours constantly to increase the yield from the digesters have led to new apparatus which are able to fetch an average of 95 kg. chemical pulp out of one cubic meter of charging space.

For the conveyance of the pulp grabs are employed which are exceedingly effective.

In connection with the utilisation of the waste wash great progress has not been made. One must still always reckon on a loss of 50 per cent. in the dry weight of the wood which passes as organic matter into the waste wash.

The procuring of timber requires, as before, the greatest attention.

Very valuable hints were given with regard to the starting of chemical pulp mills. The experience obtained from extensive practice will be of good service to many and will also open the eyes of many as to the enormous expenditure of capital which is necessary in order to erect a modern plant capable of meeting all the requirements which are placed to-day on such an undertaking.

CLOSER UTILIZATION OF STUMPAGE.

In a recent statement, Prof. R. C. Bryant, of the Lumbering Department of the Yale Forest School, shows that the extent to which close utilization of stumpage can be effected is dependent directly on the markets and the prices which can be secured for the low-grade material, which comprises more than 50 per cent. of the lumber cut. The lumberman removes from the forest only as much of the stand as he believes can be marketed at a profit, although every defective log may contain some cull material which must be handled in order to secure the higher grade lumber on which a profit can be made. The past few years have seen a marked change in the character and amount of timber which is taken from a given acre of land. Where formerly only the choicest trees and the best logs from these same trees were taken, lumbermen have now reached a point, due to higher stumpage values and increased market prices for lumber, where, in some sections the entire stand is removed, down to a diameter of from 12 to 14 inches, in some cases still lower; also where low stumps are cut and where defective and knotty top logs are taken to the mill. The yield per acre for stands of the same character has increased from 400 to 500 per cent. for the above reasons.

From the above, it will be seen that a comparison of the cut from a tract of land 20 years ago with the cut from the same tract to-day does not necessarily furnish any index to the amount of growth which has taken place during that time. This is due to the lower diameter limit in use, and the much closer degree of utilization. Unless full allowance is made for these factors a land owner is likely to conclude, from a comparison of cuts, that the rate of timber production on his land is much greater than is really the case. As a matter of fact, tree growth must be measured, it cannot be estimated. This is one of the tasks for which a forester is trained. It is beyond the scope of the timber cruiser.—Conservation.

FIRE PREVENTION ALONG RAILWAYS.

According to the Fire Inspection Department of the Board of Railway Commissioners, the railways throughout the country are doing very much better this year in the matter of fire protection than they have ever done before. There has been closer compliance with the requirements of the Board, and a far greater degree of co-operation between the various agencies interested in fire prevention. In particular, the railways are co-operating much more closely than previously with the fire protective organizations of the Dominion and Provincial Governments. The situation has also been greatly improved by the increase, in number and strength, of lumbermen's co-operative fire protective associations, of which there are now two in the Province of Quebec, protecting a total of nearly 14,000,000 acres.

In the past railways have been regarded as one of the principal causes of forest fire destruction. This situation is now being rapidly changed, due to the increasing care given this matter under the requirements of the Railway Commission. The fire hazard is being reduced by the expenditure of large sums by railway companies in disposing of inflammable debris on rights of way. Great care is taken to keep the spark arresters on locomotives in good order. Through the more dangerous sections, special fire patrols are maintained, and everywhere railway employees have received special in-

strictions regarding the reporting and extinguishing of fires in the vicinity of the tracks.

Reports received by the chief tax inspector of the Board indicate that to a very great extent than in previous years, the fires in the vicinity of the railways have been adequately controlled by the railway employees and that most of the serious fires reported as occurring in May originated at a distance from the railways, frequently as a result of settlers' slash-burning operations.

BATHURST LUMBER CO.'S STOCK INCREASED.

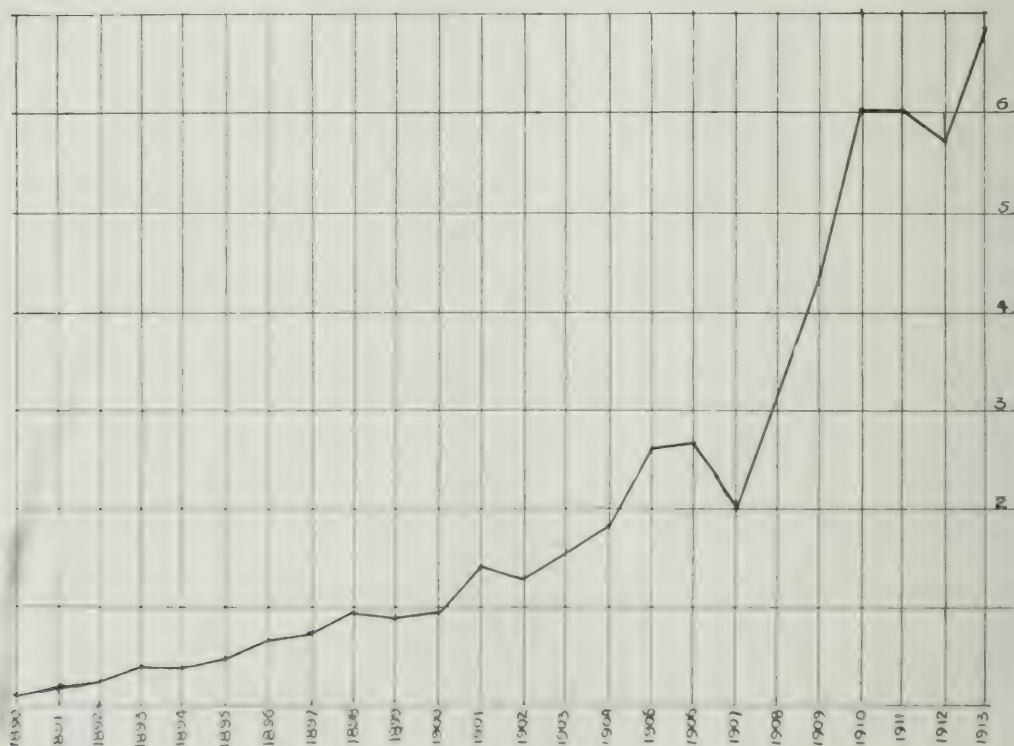
Supplementary letters patent have been issued under the Seal of the Secretary of State of Canada, bearing date the 17th day of June, 1914, increasing the capital stock of the "Bathurst Lumber Company, Limited," from the sum of one million dollars to the sum of five million dollars, such increase to consist of forty thousand shares of one hundred dollars each.

DOMINION LUMBER CO. IS BANKRUPT.

Toronto, July 3. The master in ordinary to-day appointed Frank Denton, K.C., joint liquidator of the Dominion Lumber Co. at the request of the Great Lakes and St. Lawrence Transportation Company. The Dominion Lumber Company has large timber and pulp limits in the province of Quebec.

Forestry is the art of utilizing the forest and at the same time perpetuating it. It is wholly utilitarian; it has nothing except incidentally to do with the esthetic aspects of forest growth, which concern the landscape gardener. Wood-crops is its object, just as food-crops is the object of agriculture. The only obligation which forestry imposes in the use or harvest of a forest growth is to systematically replace the harvested crop. In this obligation mainly, if not alone, does forestry differ from lumbering.—Fernow.

Canadian Pulpwood Trade



Exports of Pulpwood Blocks, 1890-1913,
in millions of dollars.

PULP AND PAPER NEWS

The Don Valley Paper Co., Limited, Toronto, have removed their city offices from 36 Toronto Street to the seventh floor of the new Dominion Bank building, where they have a fine suite of apartments.

Barclay Single Mills, Ltd., is the name of a newly-incorporated company incorporated with a capital of \$25,000 to take over the Port Haney Lumber Co., Ltd., and carry on a general lumbering business.

The Guildford Island Lumber Company, head office, Wilmington, Del., has been registered under the Companies' Act in British Columbia, to carry on a general lumbering business. The capital of the company is \$500,000.

At the annual meeting of the Wavagamack Pulp and Paper Co., which will be held at Three Rivers, Que., on July 16, the annual report will show that the past year's business has been very good and that the bond interest and all charges have been met and, after all deductions, a fair percentage on the common stock. There are \$3,500,000 bonds and \$500,000 stock outstanding of the company.

The American Wood Working Machinery Co., a corporation created under the laws of Pennsylvania, has taken out a license to do business in Ontario and is empowered to invest the sum of forty thousand dollars in carrying on operations in the province. Wm. Garlock, jr., Toronto, has been appointed attorney of the company for Ontario.

The Toronto office in the Tyndall Building, King Street East, of the Spanish River Pulp and Paper Mills, has been closed and the staff removed to the headquarters of the company at Sault Ste. Marie. Wm. Hurlbut, assistant traffic and sales manager of the company, is now located at the Soo. John G. Sutherland, sales and traffic manager, will, however, continue to reside in Toronto.

Emanuel Bernhardt, an employee of the Ontario Paper Co., at Thorold, Ont., was caught in a pulley of the shafting in the mill last week and received injuries which proved fatal. Two arms and a leg were fractured and he sustained serious injuries about the head and body. Bernhardt was removed to the General and Marine Hospital, St. Catharines, where he passed away shortly after.

Three young men, who have had wide and varied experience in paper and pulp mill engineering as well as specializing in other lines of work have formed a partnership and opened an office in the Confederation Life Building, Toronto. They are M. C. J. Billingham, W. A. Newton and W. D. Cook, the firm being known as Billingham, Newton and Cook, engineers and architects. Mr. Billingham is a former manager of the Canadian office of Dr. J. Albertson and for the past year was in charge of the head office in Kalamazoo. W. A. Newton has been manager of the Canadian office of Mr. Albertson for some time, and Mr. Cook was also connected with the same firm in Kalamazoo. Many friends in the trade will wish them success in their new enterprise.

An injunction was sought last week against the Canadian Ladies Home Journal, of Toronto, by the publishers of the Ladies Home Journal of Philadelphia, to restrain the former publication from using the present title. Chief Justice R. M. Meredith declined to grant the injunction against the Canadian publishers. The trial of the action will come up in the fall.

All the travellers, warehousemen and office staff of the Victoria Paper and Twine Co., Limited, Toronto, were entertained to a delightful trip on Saturday, July 11 by Charles V. Syrett, Manager of the company, when a visit was paid to the Garden City Paper Mills at St. Catharines. Afterwards a motor ride was enjoyed to Niagara Falls and return. The outing was one of both education and pleasure. At the Garden City Paper Mills, the visitors were warmly welcomed by L. H. Gardner, President of the Company and the other officers and shown through every part of the modern plant.

The Interlake Tissue Mills of Merriton, Ont., are still adding many novelties to their output. Last week they put on the market sealed packages, pocket size, of White Cross toilet tissue for the use of motorists, hunters and fishermen, which are meeting with a ready demand. Three rolls of Sani-White crepe tissue in attractive glassine packages is another novelty, while in the various lines of crepe paper towelling that the company turn out the rolls are all sealed at the end preventing dust and dirt getting in. Explicit directions are printed on each cover on the proper way to use paper towels. The demand for them is growing rapidly and particularly since more persons are learning how to use them without waste.

The products of the St. Lawrence Paper Mills Co., Limited, whose mills are at Mills River and Thorold, Ont., and the products of the Barber Paper and Coating Mills, Limited, at Georgetown, Ont., are now being sold under the name of the Provincial Paper Mills Co., Limited. All shipments applying on orders and contracts held by the old companies are honored by the Provincial Paper Mills Co., Limited, the charter for which was obtained several months ago. The head offices of the company are in Toronto.

The paper machine in the Don Valley Paper Co. Toronto has been equipped with granite press rolls as supplied by Bertrams, Limited, Seismes, Edinburgh.

Extensive alterations have been carried into effect in the Merriton plant of the Riordon Pulp and Paper Co. All the digesters have been relined, additional screws have been installed, a new cement floor laid and a cement roof placed on the main buildings. The former portion of the plant, devoted to making hanging paper which was discontinued about a year ago, has been converted into a screen and press room. The efficiency of the equipment has been thoroughly looked after and the output of easy bleaching sulphate pulp has been augmented by about fifteen per cent. At Hawkesbury the company has also put up another

building and added a third drying machine, giving a drying capacity of about one hundred and twenty tons per day.

An appeal will be entered to the Privy Council by the Federal Government from the judgment of the Supreme Court of Canada, that a company, operating under a provincial charter, is not confined to its own province. Much interest will be taken in the outcome by many pulp and paper concerns in the Dominion. The financial stringency has had a marked effect upon the number of federally incorporated companies in Canada during the last fiscal year, there being a decrease of 181. During the last fiscal year the number of companies chartered was 758 with a total capital of \$425,307,569, and in the previous year there were 939 new companies chartered with an aggregate capital of \$680,762,199.

The Board of Trade, Toronto, will move into new quarters on the completion of the twenty-storey Royal Bank building, which is the tallest structure in the British Empire. They will occupy the entire nineteenth and twentieth floors, which will be elaborately fitted up. W. P. Gandy, who is Vice-President and Managing Director of the Kinleith Paper Mills and W. J. Gage Co., is President of the Board of Trade.

At a meeting of the Ontario Medical Council in Toronto last week, some criticism was offered by the members of the new Ontario Workmen's Compensation Act, in that the act, as finally passed, makes no provision for the payment of the doctor's fees for attendance on the injured workman out of the compensation. The physicians feel that this should be done and, during the last session the Ontario Government was interviewed, but the medical men did not succeed in having the stipulation made. In the meantime the doctors will keep up the agitation to have such a clause included in the act.

At the annual meeting of the Canadian Press, Limited, held in Toronto last week J. F. MacKay of the Toronto Globe and J. E. Atkinson of the Toronto Star retired respectively from the offices of President and Secretary, which positions they have held for the past four years. E. F. Slack, of the Montreal Gazette, was elected President, E. H. Macklin of the Winnipeg Free Press, First Vice-President; W. J. Blackburn, of the London Free Press, Second Vice-President, and John Lewis of the Star, Montreal, Secretary-Treasurer.

The Standard Paper Co., Toronto, have been appointed agents for Canada for a waterproof board made in Sweden. It is put together with a waterproof paste and the board can be left in water and so absorbs its wet resisting qualities that no effect is made on the board.

HALF A MILLION IN JUDGMENT

According to the statement handed down by the Court of Review of Quebec, the one \$500,000 will go to M. J. O'Brien, of Renfrew, Ont. Mr. Rainboth, of Ottawa, some time ago pleaded for a quarter interest, in timber and trap wood limits, worth \$2,000,000, which was accepted by Mr. O'Brien of Renfrew, and himself, in private sale from the Provincial Government. When Mr. Rainboth entered into two years ago before the High Court a decision was reached that the agreement between the two parties was void, and of no effect. The Supreme Court maintained the action and declared that Mr. Rainboth was entitled to his one-quarter interest. The Honorable the Court of Review supports the claim of Mr. O'Brien.

Personals

G. C. Winlow, of the Canada Paper Co., Toronto, has returned from a business trip to Chicago and other western cities.

Mr. Hagar of Lilla-Edets, paper manufacturers, Sweden, was in Toronto and Montreal last week calling upon the trade.

J. Smith, representing the Wrenn Paper Co., of Middleton, Ohio, was in Toronto and other Ontario cities last week on business.

E. W. Tobin, and F. N. McCrae, of the Brompton Pulp and Paper Co., East Angus, Que., were in Toronto recently on business.

J. F. Ellis of Barber-Ellis, Limited, Toronto, who is President of Barber, Ellis, Davis, Limited, Calgary, has been on an extended trip to the West.

Howard Hitchcock, representing the Eaton, Dikeman Co., blotting paper manufacturers, Lee, Mass., was in Toronto and other Ontario cities last week on business.

B. Webster, representing Edward Lloyd, Limited, papermakers, London, was in Toronto and Montreal last week on business. He also covers India and China for his firm as well as Canada.

T. H. Watson, formerly President and General Manager of the Spanish River Paper Mills, Limited, Toronto, is now President of the Canada Machinery Corporations, and has his office in Galt, Ont.

G. A. Howell of the Howell Trading Co., Toronto, has returned from a business trip to Grand Rapids, Kalamazoo, and other points in Michigan, and reports that business in the pulp and paper line is improving somewhat.

W. P. Rylie, General Manager of the Backer Co. of America, Limited, who was recently in London, Eng., attending the annual meeting of the company, has returned to Toronto after an extended visit to the Eastern States.

NEW CRANE BULLETIN.

Bulletin B. 7 has just been issued by the Herbert Morris Crane and Hoist Company, Limited, and a copy has been forwarded for our inspection.

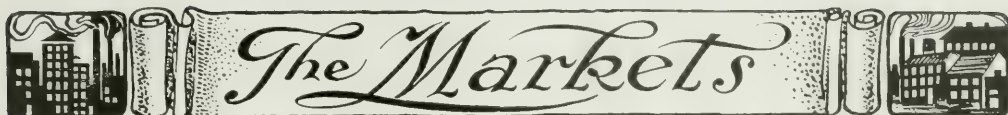
This bulletin is devoted exclusively to the Morris Type S. 1 Hand Operated Overhead Travelling Crane, which is a very light crane, designed in various sizes up to one and a half ton.

By making all the main parts of rolled steel sections the weight of the crane itself has been kept very low, thus avoiding that disproportion between the dead weight and the live or useful weight which is so often a discouraging feature of all Overhead Travelling Cranes.

Page 3 is a very interesting feature of the bulletin, describing as it does a large number of alternative constructions of the lifting gear, which are available for use under the varying conditions which are to be found in the many different factories in which this type of crane can be used to advantage.

Copies of the bulletin will be furnished on request.

When fire protection becomes a matter of the individual responsibility of the citizen, then, and not till then, may a reduction in the enormous fire loss in Canada be expected.



The Markets

CANADIAN MARKETS

The general tone of the news market continues good and a steadily increasing demand is reported from across the line. Of course, very few contracts are being placed just now but most mills have practically all their output covered for some time to come. In fact, nearly all members of the trade are of the opinion that, during the present depression which has continued for some months, the news print plants have suffered less than any other branch of the business. Those who seem to have felt the drawback the most are wrapping paper mills. Book and writing plants are doing a fair business, although some price cutting is reported in the extra fine class of writings in order to secure orders. In ground wood the situation is dull and the business is confined to regular shipments on contract requests from consuming centres. Water conditions have not improved with many of the plants in Quebec, and about the highest price obtained is \$22 to \$23 delivered, varying according to freight rates. There are rumors in the trade of some sales being made at exceptionally low figures in order to keep the grinders moving. Chemical pulp is holding up very well, although prices are a trifle easier than in the spring. Board mills are rather quiet but tissue and toilet concerns are kept going nicely as the demand for crepe articles in the way of table coverings, napkins, paper towels and other specialties is always good at this season of the year when camping and picnics are popular pastimes. Very good business is reported in the specialty line. The rag and paper stock market is weak and no improvement is looked for before the fall months. Paper houses report that the turn over for June was very good on the whole, although stocks are low, and there is a strong disposition to limit buying to small quantities. In most Canadian cities building has not been as active as last year, and roofing and building papers are in poor demand, while values in kraft papers are weak. Following are the prevailing quotations f. o. b. Toronto.

Paper.

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.20 to \$2.50, depending on quantity.
 News (sheet), \$2.05 to \$2.15 at mill, in carload lots.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila, B., \$2.56½ to \$3.25.
 Manila, No. 2, \$2.85 to \$3.50.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$3.75 to \$4.75.

Pulp.

Ground wood (at mill), \$15 to \$15.50.

Ground Wood, \$20 to \$23.

Sulphite (unbleached), \$41 to \$42, delivered in Canada.

Sulphite (unbleached), \$42 to \$43, delivered in United States.

Sulphite (bleached), \$55 to \$56, delivered in Canada.

Sulphite (bleached), \$56 to \$57, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.87½ to \$1.90, f. o. b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 45c.
 White blanks, 87½c. to 90c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c. to 50c.
 No. 1 book stock, 70c.
 No. 1 Manila envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 27½c. to 30c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.20 to \$1.25.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinetts, 70c. to 72½c.
 Flock, 80c. to \$2½c.
 Tailor Rags, 65c.

Quotations f. o. b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5½c. to 6c. per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c. to 7½c.
 Sulphite Bond, 6½c. to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manila, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manila, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manila, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.
 On large orders to the jobbing trade some manufac-

papers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
News quality, \$41 to \$42 per ton.
Bleached sulphite, \$54 to \$59 per ton.
Kraft pulp, \$3.60 to \$4.00.
Ground wood, No. 1, \$15 to \$16.
Ground wood, No. 2, \$22 to \$24, delivered United States.

THE BRITISH MARKETS.

Special to Pulp and Paper Magazine.

London, July 3, 1914.

Business in the British paper industry shows very little improvement, and unemployment shows also an increase when compared with this time last year. The changes of paper manufacturers for the past six weeks have been taxed to their utmost capacity in efforts to rid themselves of the large stocks they have on hand, and, whenever possible, price-cutting has been resorted to so as to counteract the sale of foreign papers and relieve the present dull situation. It is now nine months since the British paper manufacturers have fallen into this dull period and it is principally the export trade that is suffering mostly. On export account there appears to be very little new business passing and were it not for the supplies being delivered under contracts, or in accordance with old standing agreements, the outlook would certainly be very gloomy. The domestic demand is only fair, just sufficient to keep most of the mills from shutting down machinery. Fine writing and printing papers are having a fair outlet, but newsprint still keeps in the background at 3 and 4 cents per lb. and probably a small discount off. Packing and wrapping papers are passing off freely, and so are esparto papers, the demand for which has all along been satisfactory, but the cost of production very unsatisfactory to mill owners.

* * *

Moist ground wood, or mechanical pulp, is still in a depressed condition so far as market conditions are concerned. Producers and importers, however, are very firm in their quotations. There are reports in London that the Germans are enquiring in the Scandinavian markets for ground wood, owing to the low water conditions in the Fatherland. Scandinavians also complain of low water, and if there is no immediate improvement it may safely be stated that prices will be low in London, as well as in Scandinavia. Prices are now about as follows at British ports:

Pine, 40 per cent, prompt, unwrapped \$8.00 to \$9.50
Pine, dry, prompt, 1920 to 1950

* * *

In sulphite only prompt dealings are engaged in and prices are on a lower basis. Sulphite has exchanged hands for next year's delivery at current values, but the report of business done on the whole has not been very great. Soda kraft is unchanged and dull. Deliveries are pending in large quantities under contracts and stocks at mills are large. Scandinavian reports state that business is very much. Prices are now about as follows at British ports:

Bleached sulphite, \$4.00 to \$5.00
Easy bleaching sulphite No. 1, 38.40 to 40.00
News quality, 36.70 to 37.00
Unbleached soda (No. 1), 36.00 to 37.00

Unbleached soda, strong quality, 36.60 to 37.90
Soda Kraft, 34.00 to 37.00

* * *

Trade in esparto is fair, but sellers are firm and inclined to advance prices on prompt deliveries. Values at present show no sign of reaching a lower basis. Rags of all descriptions are experiencing a poor trade, owing to the dullness in the paper industry, and prices are easing somewhat.

* * *

A fair amount of business is passing in chemicals, caustic soda is \$48.60 for 77 per cent, and \$48 for 70 per cent., bleaching powder is \$27; ammonia alkali, \$20 for 58 per cent.; soda crystals, \$9.90 to \$10 per ton; salteake, \$9.90; alum, \$28 to \$29 per ton for lump and about \$4 extra for ground; sulphur \$26 per ton. In filling and loading minerals contracts are now being made for 1915 on the same basis as the 1914 contracts. Mineral white, gypsum and other such like fillings are unchanged and dull.

NEW YORK MARKETS.

Special to Pulp & Paper Magazine.

New York, July 11, 1914.

The situation in the local ground wood pulp market is essentially without change in the interval. Some manufacturers report that they have contracted for about 25 per cent more than their total output. This excess contract was made for the purpose of meeting the falling off in consumption due to requests to suspend shipments that occur from time to time. Others report a fair number of inquiries for new contracts, but only a few coming to closed transactions. Old pulp has been fairly well sold out by a number of manufacturers, and others have entirely moved the large piles that were stored at grinding centers during the period following the Miami Valley disaster. At present grinders are holding firm to \$16 at the mill for fresh pulp.

The quotations on foreign chemical fibres have remained practically unchanged. A few contracts for unbleached sulphite pulp were reported in the interval. The price being about 182½. Bleached sulphite is in poor inquiry and the present quotation of 2.55 to 2.65 is for contracts covering the current year only. It is said that better values can be had in deals covering 1914, 1915 and 1916, or even covering this year and next. Sulphate and kraft pulp are in poor demand and values are weak.

Rags and bagging have reflected an uneventful market. Mills make large rejections of locally collected rags. This situation is probably due to the fact that prices are very low and dealers cannot afford to make very close sortings of the automatically baled rags that are collected from the apartment houses and hotels. All kinds of trash are thrown into the baling machine as the machine will bale anything.

The demand for old waste papers has been rather poor in the interval. Most activity has been in flat stock as book mills have been more active than any other consumers of old papers. There are fairly good supplies of white shavings on hand, which are quoted at \$2.30 to \$2.40 a hundred pounds for high grade hard shavings. Soft shavings are quoted at \$1.75 to \$1.85 for No. 1 whites and 75c to 85c for high grade colored shavings. Heavy magazines are selling at 85c to 90c, and ledger stock at 1.40 to 1.45. The demand for old papers is poor and values are rather weak.

Pulp.

Ground Wood, No. 1, \$19 to \$23, delivered.
 Ground Wood, No. 2, \$15 to \$17, delivered.
 Unbleached sulphite, dom., 1.90c to 2.00c delivered.
 Unbleached sulphite, imptd., 1.82½ to 1.95c, ex dock, New York.
 Bleached sulphite, domestic, 2.75c to 2.90c, delivered.
 Bleached sulphite, imptd., 2.60c to 2.70c ex. dock, New York.
 Easy Bleaching, imptd., 2.05c to 2.15c, ex. dock, New York.
 Unbleached sulphate, imptd., 1.75c to 1.85c, ex. dock New York.
 Bleached sulphate, imptd., 2.50c to 2.75c, ex. dock, New York.
 Kraft Pulp, 1.70c to 1.85c, ex. dock, New York.

Paper.

There has been a noticeable improvement in the demand for practically all grades of paper. Jobbers' stocks had been allowed to run down until it was necessary to lay up stocks in order to meet the demands of consumers. This situation has brought about a great deal of very keen competition among mills in order to get the orders. It has led to more or less price cutting in practically all grades as jobbers would realize that there were so many anxious salesmen at hand that they felt some would have to cut the price to induce them to buy. Several days ago there was some alarm among the book paper manufacturers when it was reported that an M.F. had been offered at 3½c. Investigation revealed the fact that the paper was of very inferior quality, and that 3½c was a fair price for it. The paper resembled a white news. Another cut that caused more or less of a sensation was that made by a jobber who, it was said, had sold three cars of a high grade imported kraft at 3½c. There has been a healthy demand for newsprint. Some of the large metropolitan dailies have increased the size of their rolls and this has increased the consumption from the point of view of tonnage as no decrease in the number of pages has been noted. Sheet news is in fair demand at 2.20c f.o.b. New York. Side runs have been in good demand, owing to the opening of summer resorts where large shipments were delivered. The price in the local market was 2.05c for 12 and 15 inch rolls and 1.95c to 2c for 9 and 18 inch rolls. Activities in book papers is a little more acute than for the past two months, as magazines and publishers are now preparing to make their contracts for fall delivery. Manilla and fibre papers have been in rather poor demand in the interval, as have boards and prices rather weak. Strawboard has been freely quoted in the local market at \$26 a ton. Newsboard is in fair demand, only at \$30, which is \$1 a ton less than the price quoted during March and April. The tissue market is still rather quiet. It is reported that some manufacturers contemplate an advance in the price of No. 1 white to 42½c a ream on car lots. The demand for paper bags has been fair, but prices have been weak in New York. Under an increasing demand there is a little firmer tone to paper bag prices at present. Roofing and building papers have been in poor demand owing to the small amount of building this spring. Present quotations are about \$32 for regular felts and \$33 for slaters. Asbestos paper is now quoted at \$32 a ton. Specialties are in fair demand. Paper towels, toilet papers and paper cups have enjoyed good inquiry, and have commanded fair prices.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.

News, side runs, 1.95c to 2.05c.
 News, sheet, \$2.20 to \$2.30 f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13½c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manilla jute, 4½c to 5c, delivered.
 Manilla, wood, \$2.40 to \$3.00, delivered.
 Kraft, No. 1, \$3.50 to \$3.75 f.o.b. New York.
 Kraft, No. 2, \$3.25 to \$3.50, f.o.b. New York.
 Boxboards, news, \$30 per ton, delivered.
 Boxboards, straw, \$26 per ton, delivered.
 Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 40c to 42½c f.o.b. New York.
 Tissue, bondrunner, 4½c to 50c f.o.b. New York.
 Tissue, jute Manilla, 40c to 41½c f.o.b. New York.

THE SWEDISH WOOD PULP TRADE.

Mechanical pulp. There is a firmer and more confident tendency in this market on account of reports about low water and chances of reduced output at some of the large mills. Any marked increase in prices has, however, so far not been suggested.

Sulphite. Sales are still mostly for small parcels and prompt delivery, but as we mentioned in our previous report there are less inquiries in the market for delivery during the next and the following years, but no business has, so far, been effected.

Sulphate. We have been informed that a large contract has been placed for delivery during next year for kraft pulp at 57 is the f.o.b. and satisfactory agents' commission and discount, which must be considered a very favorable price for the seller during the present situation on the sulphate market.

—*Afternoon paper, June 17th*

FIRE RAGING ON ISLE OF ANTICOSTI.

Southwest Point, Anticosti Island, July 13.—For several days a fire has been raging in the bush near Ellis Bay, Anticosti, and has now extended to a width of five miles. Already great havoc has been wrought in the pulp wood area, about seventy thousand logs having been burned. The loss on wood will run into thousands of dollars.

All the available men in the district are fighting the fire, but with little success. There seems, however, to be little danger to the town of Ellis Bay at present, though it is feared that the fire may continue until a heavy rain comes, and if high winds should occur at any time, the situation might become very serious.

At Ellis Bay there are large mills for cutting the pulpwood into merchantable sizes, and during the summer season a lake steamer is loaded almost every day and the cargo taken to Oswego and other lake ports. The whole island is exploited for its pulp wood by the Anticosti Company of which the Hon. Hays Munn was proprietor.

ENGLISH PULP STONES

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OUR OWN QUARRIES

Machined and Fitted

at our

MONTREAL WORKS

Prince and Brennan Streets



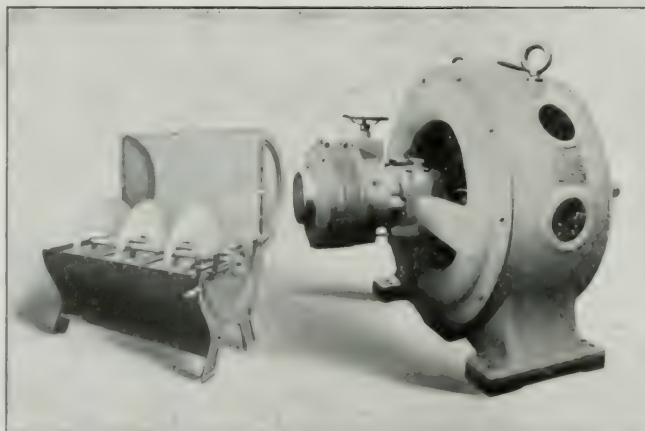
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MOTOR FITTED WITH OUR STANDARD BRUSH LIFTING AND SHORT
CIRCUITING DEVICE.

We have in Montreal a large stock of squirrel cage 550 Volts 60 cycle and 25 cycle motors and can give prompt shipment.

We shall be glad to quote you on your requirements for all kinds of electrical apparatus.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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VOL. XII.

MONTREAL, AUGUST 1, 1914

No. 15

The War Crisis

As we go to press, the world is stirred with a danger whose magnitude can hardly be grasped. The threatened hostilities between Austria and Servia may easily involve Russia, France, Germany and Great Britain and other nations, and every country in the civilized world is taking steps to resort to arms if the need should arise. The war cloud which is hanging over Europe to-day would precipitate the greatest calamity in the history of Western civilization. Progress would receive a set-back of generations.

Temporarily the pulp and paper industry of Canada would receive a tremendous impetus. The Cuban war sent the newspaper circulation of the United States up 25 per cent, and the South African war caused an increase of 15 per cent in pulp and paper consumption. Already in the present crisis one Toronto newspaper has had noted a jump of 15 per cent.

In the event of great hostilities the large part of pulp export from Europe to America would probably be cut off. This amounts to about 350,000 tons a year. Canada is in no way fitted to undertake to supply such a quantity. It is doubtful if an increase of more than 10 per cent could be brought about. We might, therefore, look for a great rise in prices for our pulp wood and a tremendous tax upon our news mills.

However, it is safe to say that not a manufacturer in the country believes that the industry would be advanced as a whole by the demand. The distorted business conditions which the war would bring about would ultimately work untold damage.

The destruction of the best manhood of the race, the devastation of lands and the uprooting of industry cannot fail to impoverish and impede the world.

Investigation Co-operation

The Forest Products Laboratories of Canada, under the direction of Dr. J. S. Bates, is quietly laying plans for one of the most useful works which has yet been undertaken in the Dominion. As rapidly as possible the various problems peculiar to the wood producing and wood-consuming industries will be investigated. In general, the plan of studies and research which was reported in the columns of this magazine several months ago will be followed. The work has the warmest support of the Minister of the Interior and the active participation of the Director of Forestry.

The pulp and paper industry is particularly fortunate in having in Dr. Bates a man whose hobby has been beaters, digesters and driers. Further, the appointment a few days ago of Mr. O. F. Bryant, B.S., who has had both theory and practice well instilled in some of the largest mills in the continent, will be received with warm approval.

There is to-day not a branch of the paper business which does not need the untiring investigations of Mr. Bryant and all other earnest seekers for the light. Improvements in the art of paper-making such as are not dreamed of at the present time are due to come sooner or later, but the intricate operations of natural laws are not laid bare without hard work. The practical man, whose experience of many years places him in pre-eminent position in the art should, and doubtless will, find in the Government investigators the most sympathetic, painstaking and enthusiastic of friends and co-workers.

In this connection it is interesting to note two advances which have been made in certain mills in the Dominion. In one, practical tests on the efficiency

of grinders are being carried out by the grinder room superintendent, and in others, complete experimental apparatus consisting beaters, sulphite digesters and laboratory apparatus is to be installed. These are most hopeful indications from which a great impetus to the industry may be expected. Collaboration with the Forest Products Laboratories, when its equipment is installed in September or October, will have a powerfully stimulating effect.

Quality of Wood

An inspection of the pulp-wood stock of several concerns in Eastern Canada reveals wide divergences in the quality of raw material used, and in the extent to which the sticks are barked before being put into the grinder. Some firms bark very closely with the standard rossing machines, the material removed in this way, it is said, running as high as 15 per cent. of the total volume of the stick. The tendency is away from this heavy trimming, however, and, while the rosser will doubtless occupy a distinct place in the production of high grade papers, the increasing demands for ground wood will render necessary the introduction of more barking drums and the passing on to the stones without trimming of a large part of the wood supply.

An experience quoted from a German paper shows what difficulties may be anticipated:

In a paper mill a quantity of printing paper was so flabby and spongy that it was rejected by the customer. The paper-mill made both chemical pulp and also mechanical wood-pulp itself, but had to buy some of both as well. A comparative investigation was made of papers made from bought chemical pulp and bought mechanical wood-pulp, also from the home chemical pulp and foreign mechanical wood-pulp, in addition, from home mechanical wood-pulp and foreign chemical pulp and, finally, such as was made only from home raw materials.

90 per cent mechanical wood pulp from old, well-seasoned, defective timber resulted in flabby paper, even when 10 per cent hardest sulphite cellulose was added.

90 per cent high-grade mechanical wood pulp made from fresh healthy timber resulted in a printing paper of good klang even when 10 per cent soft sulphite cellulose was added. If the admixture of soft cellulose was increased to 30 per cent a paper of good klang was still obtained. Only when 10 per cent soft cellulose was added did the paper become flabby.

Soft mechanical wood pulp made from defective timber made printing paper of good klang even when the hardest chemical pulp is employed.

The superiority of healthy ground wood is seen from the fact that best old timber is sorted out from the timber intended for graining purposes and is used for making chemical pulp or brown wood-pulp.

Healthy forest spruce naturally grows in locations with favourable climatic conditions. What is true of

white pine is also true of spruce, i.e., that the farther north you go the poorer you find the trees. As the regions closer to the centres of population, transportation facilities and markets are cut out, poorer grades will be called into requisition. Also, the decrease in the supply of spruce will requisition the use of much Balsam Fir, a tree which is peculiarly subject to fungus attacks. Rotten, shaky and dozey wood will find its way to the grinders in increasing quantities. Having little fibrous length or strength, it will not benefit the pulp. Recourse will have to be had to splitting and cutting, in order to get rid of the punky spots. The injury from decayed wood is a point that deserves the closest attention, for it is undoubted that as time goes on it will be necessary to use poorer qualities of material.

The Love Feast of Competitors

The enthusiastic demand which has greeted a Canadian reprint of an article by Forest Crissey in the Saturday Evening Post shows that his words on "The Love Feast of Competitors" are well founded in the modern business spirit. The article is reproduced in part below.

Service, co-operation and open dealing are the characteristic of business. It is this spirit which dominates the Pulp and Paper Association of Canada. Very rapidly there is being built up a confidence in competitors and a broad desire for co-operation which will place the industry on a footing so stable that business vicissitudes can not seriously affect the fortunes of those concerned.

The instances of benefits from co-operation are numberless, and Mr. Crissey says in his article, the movement is practically in its infancy. The future of the pulp and paper industry in Canada is one of the brightest aspects of the nation's prosperity. Association work will render the advance permanent.

Only a few years ago it was the fashion for the aggressive manufacturer, who found his competitor was getting the best of him in the guerrilla warfare of rampant personal competition, to send a spy into the enemy's camp to purloin all the trade secrets on which he could lay his hands.

Today, however, they are not doing this in the best industrial circles. The lively little game of trade spying has passed out of vogue, along with dominoes, pinochle and pussy wants a corner. Instead of sulking in his tent, despatching trade spies and plotting against the industrial life of the other men in his line, after the manner of a chieftain engaged in barbaric warfare, the up-to-date manufacturer is attending the love feast of competitors and putting his fighting energies into a campaign for the good of the line.

In a word the present-day manufacturer who is a live wire puts in more time attending the meetings of his association than he or his predecessors ever spent in scheming to steal trade secrets from competitors.

Of course there are some survivals of the old school of mutual suspicion who still linger in the land of the Philistines and believe that every man's hand is against them; who continue to talk of the survival of the fittest; and look on all competitors as natural and unalterable enemies.

But these remainders of the old order are not representative of the present hour; they are out of pace with present-day thought and methods and their faces are set towards the past instead of being turned to the future and its cleaner, saner and more constructive methods.

Any man who is strong and broad enough to be a bellwether in his particular business world will unhesitatingly declare that the modern association is the biggest and most significant sign to be found on the face of the whole industrial sky; that the love feast of competitors is the most important function on the business calendar of the down-to-date manufacturer; and that the association movement is an economic uplift that has already accomplished miracles of service to the consumer, the middleman, the manufacturer and seller of raw materials—and this in spite of the fact that the movement is practically in its infancy and has not yet had a chance more than to scratch the surface of the field of its potential usefulness.

Beyond doubt the trade feud is the most common, wasteful and insidious form of industrial warfare. It has ravaged entire industries, and there is scarcely a manufacturing community that has not felt its blighting touch. Hundreds of individual enterprises have been wrecked by it and entire cities have been sent out of a multiplied prosperity because of its wasting and bitter persistence. If the trade association of today could lay no other claim to consideration than its achievements as a smotherer of trade feuds its respect would be doubly justified.

No one will deny that the demoralization of any useful industry is an economic waste—a bad thing for the public at large—and that its stability, based on a sure but moderate profit, is the ideal condition for the consumer as well as for the producer or collector connected with its activities. Wreckage always means waste, and financial wreckage is no exception to the rule. A few individuals may secure momentary benefit from an industrial failure, but to society at large it invariably involves a final net loss. Labor suffers, investment suffers, and the body of business in general is disordered.

Advocates of the association idea declare that if you would place your finger on an industry that is unstable, precarious, and the prey of bitter and devastating trade feuds you have only to find a line that has no association, that does not know the definition of down-to-date team-work, and that holds to the feudal idea that competition is a natural personal enemy. They assert too that the smoother and the business methods of supply and justice will be found as debased as its ideals.

Certainly it soon becomes clear to any man who will take the trouble to investigate the situation that the get-together spirit of the typical association of to-day is working an immense change in the personal attitude of men who happen to be thrown in the same line of business activity. To replace devastating in satisfaction over losses inflicted on competitors, personal animosity—which is willing to take its profits instead of in real profits—with mutual understanding, with constructive plans for the good of the line as a whole, is a distinct economic gain.

A manufacturer of malleable-iron specialties had been listening to an account from his seatmate of how a spy had been sent by the owner of a certain factory into the works of his competitor, and had been betrayed by the occurrence of a dramatic accident.

"That's a very moving little tale," retorted the malleable-iron manufacturer, "but the men you tell about are out of date. They're 'way behind the times. They need to put in a rush order for an association missionary and save their spy expenses for association dues and teamwork. Association work is cheap, too, by comparison with spying. I'd hate to think what our line would be without an association. Instead of constantly reaching for one another's throat we're doing something for the good of the line and everybody in it. You can appreciate the spirit of that work without being in it. Let me illustrate this:

At our last meeting, when the formal business was over we fell to discussing foundry problems. I confessed that there was one which I hadn't mastered, and that it would be worth a lot to me if I could. Then I explained just where my process fell down. One of the shrewdest men in the trade immediately spoke up and said:

"Oh, I've got that trouble beaten—with a trick that is as simple as anything. What you want to do is this"—and then he went into details and explained the whole process. When I returned to my factory I tried it out and it worked to a charm. That one bit of information has been worth a heap to me; and my competitor would never have given it to me if it had not been for the kind of contact brought about by the Association.

"Again, when the manufacturing world in our part of the country was facing a coal famine and I confessed that my supply was desperately short a competitor rose in our meeting and said that he happened to have a surplus he would not need to carry this through, and that he would be glad to send me a few carloads to help me out.

That's the modern association spirit. You can't beat it. Sneaking trade secrets and trying to throttle the man whose success is in your competition belong to the Dark Ages of industrial competition. In the period of feudalism the association is not driving out of business."

COMMERCIAL EFFICIENCY OF MACHINES

COST OF OPERATION AS COMPARED WITH FIRST COST.

By JOHN W. BRASSINGTON.

(Special to the Pulp and Paper Magazine.)

The most insidious of the engineer's enemies, the one most likely to undermine his reputation and spoil his endeavor, is the ever-present temptation to reduce the first cost of the enterprise for the success of which he is held to be responsible. This wolf in sheep's clothing is often of many countenances; sometimes looking through the lineaments of the financial backers of the undertaking; often appearing in the wiles of the purchasing agent, and again threatening with the fear of a too slim estimate. Strong indeed and of great foresight is the man who stands firm in judgment, and demands that before all things the efficiency of the apparatus installed be considered as paramount and pre-eminently superior in consequence to first cost.

It is human to Epimethean in effort, it is Godlike to be Promethean, and it is written that the latter is even harder to achieve and even the more unpopular and condemned as it approaches true wisdom. Once the engineer gives way to the temptation to cut the first cost against his better judgment, he begins to sow tares amongst the wheat of satisfactory results. The severity of the punishment meted out to many mill designers and owners, for this lack of judgment in the past has caused the error of injudicious economy in first expenditures to become far less frequent than used to be the cause, but the manufacturing landscape is still dotted with mills suffering from too little boiler power, inefficient engines, rattle-trap machinery, and the thousand and one evils that descend Nemesis like on the plant that is maltreated at its commercial birth.

The difference between a cheap and nasty piece of mechanism, and an efficient and possibly costly substitute is bound to show in operation under the following headings:

1) Decreased capacity: either the mechanism is too highly rated by the seller or the purchaser has hoped to save in first cost, with the intention of overloading the apparatus.

2) Shutting down for repairs: this is, of course, a sure result of forcing a machine beyond its capacity.

3) Upkeep and repairs very expensive and deterioration very rapid.

When the boilers and prime movers of a mill are incapable to carry the load, the cause is not necessarily chargeable to the boiler plant, though if the boiler capacity is hopelessly inadequate, it is a fault that should be corrected at once; no mill superintendent should expect to keep a dark record of the boiler load so he can ask with reason and force when necessary for that more boiler power will enable him to handle his load day in and day out, and at the same time always have his boiler being cleaned and put in first-class condition. As stated above, however, it may not be lack of boiler capacity that is the besetting sin of the power end, because it is sometimes the case that the steam engine, that is, the steam, are cheap and inefficient; an overrated engine or one that has leaky valves or inefficient valves, or often use more the amount of steam than a better designed, a better kept, or a larger engine would require to do the same work.

The writer remembers one plant that came under his personal supervision on which he obtained, after months of fighting, permission to spend fifty thousand dollars (\$50,000), correcting cheap conditions. When the new apparatus was installed and in operation, the fuel bill dropped \$300 a month. The money was spent not in new engines, because we could use all the exhaust steam, but was chiefly spent in correcting piping, feed water heating, pumps and boiler parts. It is nothing unusual to find a power house with its component parts balanced about as follows: for every 100 horsepower of boiler there might be 50 horsepower of grate, 75 horse power of stack, inadequate boiler feed heating apparatus, 25 horsepower of engine, and a load running from a minimum of 10 horse power to a peak of 150 horsepower in 24 hours; all this with the engines eating steam and exhausting to the atmosphere. Often the boilers are burning soft coal on grates designed for anthracite, with long narrow tortuous gas passages to the stack. Each a plant invariably goes what is colloquially called the limit, and on top of conditions of this sort will suffer from lack of proper pipe covering, poor drainage of steam pipes, no traps or worse than no traps, overloaded motors, inadequate wiring, shafting out of line, size, etc.

It is a trying experience to listen to the engineer of such a plant, together with the superintendent and the owner, expatiate on the impossibility of locating some power trouble while they look for words of commendation from their listener. Of course, with the prevalence of such troubles, their evident remedy is often as a tale that is told; the moral is accepted and seldom acted upon. It is, however, more often than not that the great majority of the troubles that develop when a plant is operated for a few years are directly chargeable to an effort to cut the first cost by the original designer.

Possibly it is not always the conscious fault of the mill architect and engineer that the output of a paper mill is choked at the outlet by the installation of a cheap or of an inadequate paper machine; one object of this article is to point out some of the salient points of a paper machine that deserves attention and investigation from an intending purchaser before determining on the size and make which he will recommend as the most desirable for the working future of the mill in which he is interested.

The main points of consideration in buying a paper machine are as follows:

(1) "Reputation of similar machines by the same maker for continuity of service." A good measure of this is obtained by stating the output of similar machines in pounds of finished saleable paper per inch of width of wire, per day, as shown by the average production in tons per day for any given period of continuous service. It is quite an interesting study to compare the average productive power of paper machines on this basis. The first cost of a machine averaging say \$500 per inch of width when compared with

another averaging say only \$400 per inch of width, seems large to the prospective purchaser; but suppose the first machine will make say 700 pounds of finished paper per inch of width per day on the average, while the second will only deliver say 600 pounds per inch of width in the same time, as far as can be determined by averaging up known performances. If such be presumably possible, then the first machine would pay back its excess cost per inch of width three times in the first year. These figures are given to illustrate the point of reputation; the application of the principle of research of which they purport to be an example, should be within the ability of a prospective purchaser, armed as he is before purchasing, with the power to make his inquiries very interesting to those who wish to secure his order.

(2) Accessibility of parts tending to shorten the time of putting on new clothing, washing felts, etc. The larger a machine the more important this point becomes, because the period of inaction of the machine during these necessary operations is more prolonged owing to its size, and at the same time, the quantity of output that is lost during these intervals is correspondingly increased. In order to illustrate this point let us assume that the finished product is worth \$40.00, and the stock is worth \$30.00 a ton, giving a loss of \$10.00 for every ton of paper not made. Let us assume that one machine will make almost 50 tons a day or say roughly over two tons an hour, that is, it is nearly 150" wide, making news. For every minute the machine is not in operation, there is a loss of 33 cents, about \$20 an hour. For a 200" wide machine, this amount is correspondingly increased. One hour gained a week in the time consumed in manipulating the clothing of a machine is equal to \$1,000 gained a year, or at 10 per cent. to \$10,000 difference in first cost, that it is well to be willing to pay for the more efficient machine in this respect only.

(3) Percentage of operating time lost due to the breakage of the paper: this is a measure of the efficiency of the design of a machine in a manner so intimate and so innately true that it is surely of great interest to the intending purchaser to find out if possible what difference there may be between the percentages of idle time, expressed as ratios of the greatest possible operating time, for all the makes of machines he may have under consideration. A very few hours of idleness on the part of a machine during the year will not only destroy any saving that may have been affected in the first cost, but it will also skin the cream from the profit of the mill, and send it back to the beaters to absorb more labor.

(4) Cost of upkeep. This includes not only the actual cost of repairs and replacements, the regrinding of rolls, etc., etc., but also the cost of lost output, owing to the enforced loss of product due to a breakdown. The life of a paper machine is, of course, largely, depends on the durability of the design, such durability of design is only obtained by long experience. The ultimate value of a paper machine to its owner is more dependent on its life, its continuity of action, and its independence of repairs than upon its first cost.

(5) As a paper machine depends on its capacity, or rather its ability to produce a large quantity of paper per unit of time in order to show an adequate return for the money invested in it, and as it is really the ultimate crowning essential element in the commercial success of all the operations that lead up to it, it is of prime importance that first cost be given a distinctly secondary place in comparing two paper machines with

the intention of selecting one. On the Fourdrinier part, the comparative areas of the two forming tables should be contrasted, and the number of feet of roller contact per foot per minute should be noted. The design of the bearings of the suction boxes, of the capacity for change of elevation, all are far better worth considering than the dollars and cents view. When it is remembered that a difference in price of \$25,000.00 at 10 per cent. interest is \$2,500.00, which means the amount lost at \$10.00 a ton, by a shut down of five days, of a machine 150 in. wide, or of three and three-quarter days of a machine 200 in. wide, or to illustrate in another fashion a difference of twenty-five thousand dollars saved in first price by buying a cheaper machine may result, if the cheaper machine is not as good

if it loses by breaks, by changing clothing, by washing up, or by late starting, only a little over 1 per cent. of its operating time, if a 200 in. machine, or a little over 1½ p.c. if a 150 in. machine, in the loss of not only the interest at 10 per cent. of the money saved on the first cost, but also in cutting profits on a larger amount invested in the rest of the mill. It is evidently a serious matter to handicap the main controller of the output by injudicious attention to first cost.

(6) A matter of importance in considering the first cost of a paper machine as compared with its value as a profit maker is the consumption of clothing by the machine. Wires are expensive, and if the design of stretcher, the squareness of the fourdrinier as a whole, and the comparatively small power required to drive it, tend in any one design to prolong the life of the wire, it is surely worth while to take this into consideration. A glance at the angle the wire makes over the stretcher roll will soon inform the observer as to which design of fourdrinier is superior in this respect; the larger this angle the more severe the stretch of the wire for the same force on the stretch roll and sometimes the front tender is a pretty husky fellow. The wire drives all the rolls except the lower couch, and if these rolls turn hard or unevenly the wire is to that greater extent strained. The smaller the number of wire rolls the better as long as their necessary service is fulfilled.

The design of the stretcher in that part of it that gives the machine tender the power to unduly stretch the felts in the press part is worthy of attention. A long felt with the minimum number of rolls, the design of the bearings, the accessibility of the parts; all these things are more important than first cost. When a paper machine does well, the owner rapidly forgets the first cost, and at the same time remembers his designing engineer with pleasure; if the paper machine gives trouble and is not making good, then the first cost is again forgotten but the designing engineer who is responsible for the installation of an inefficient machine, is remembered as something noxious that should be avoided. The engineer is never praised for what is successful in his work, though he is given more like it to do; while one failure on his part will destroy in a day reputation that has been years in the building.

The question of first cost as compared with cost in operation is of very small moment whether the mechanism purchased is a boiler, an engine, a pump, a Jordan or whatever machine it may be; and this fact is becoming recognized more and more every day by those interested in manufacturing establishments; it is, however, indisputable that the Paper Machine is without a rival commercially in its economic independence of first cost and its absolute dependence on successful operation; this is due to the great quantity and vol-

output of the output of cottons, an output so large and reasonable that all other machines may seem insignificant as compared with it. For every dollar invested wisely in a paper machine there is probably a larger return than can be obtained from any other single mechanism, while on the other hand, there is probably a larger proportion of loss, should the purchaser's money be unwisely invested in a paper machine that is cheap in money and design, than might result from any other investment.

Yet it is possible to paralyze the capacity of a first-class paper machine if it is cheaply installed, and saving in first cost is made a primary object in its immediate surroundings. It is quite possible to cut down the output of a paper machine by placing it in a cheap building where the floor beams, though strong enough, are limber and springy; where the supporting columns are designed only heavy enough for first-class warehouse practice and not rigid enough to resist the vibrations that come with machinery in motion. It is perfectly easy to make a marked reduction in the output of a paper machine, and a correspondingly large increase in the order for "broke" for the beaters, if the dryers are provided with a cheap ventilating system that a saving in first cost prevents an adequate supply of dry air, and the prompt removal of the saturated air that rises from the dryer nest as it locks up the moisture from the moving paper: five hundred cubic feet of air per pound of paper is the minimum figure that should be considered as the proper amount to supply and to remove from the environment of the dryers; twice this amount would probably be better. It is a simple matter to spoil the efficiency of a paper machine in a fine firm building, with a magnificent ventilating system serving the dryers, if the prime mover is too small for its work, an engine may be ample to drive a paper machine at a certain speed when first installed, but if often happens that a smooth running paper machine seems to urge its owner to speed it up: it seems to say "another 25 feet per minute will not hurt"; when this time comes and the engine is only just big enough and fast enough, and is indeed going its limit at the first maximum paper speed determined on, then the saving in first cost of that engine means a loss of opportunity for increased earnings.

So it seems to be well in installing the machinery in a paper mill, to insist on a rigid building first and foremost. When this is secured to determine the maximum size and number of boilers required and then add another one in the same way go through the whole mill from wood pile to shipping room, and allow for growth. If this is done and done with courage and audacity, one day ten centuries of that mill will speak highly and well of its designer. First cost is only a matter of a short time though often, to use a slang expression of a "fast time," but output is always a matter of the now. The present, so it is also to each a thought, through time, to each the "for all interest" of praise.

Benjamin Kothe, formerly of East Pepperell, Mass., has been appointed superintendent of the book and printing mill of the Canada Paper Co., at Windsor Mills, Ont., and has returned on his duties. He succeeds Robert Athlun, who resigned some time ago, after many years' service with the company. Mr. Kothe, formerly superintendent of a capable and thrifty paper mill, has been employed as a superintendent of the building department across the border.

TO BUILD UP AMERICAN EXPORT TRADE.

For the purpose of co-ordinating the foreign trade activities of the nation in an aggressive and systematic extension of American overseas commerce, Alba B. Johnson, president of the National Foreign Trade Convention, held at Washington, May 27 and 28, has announced the personnel of the Foreign Trade Council, created by resolution of the several hundred delegates from all parts of the United States who attended that conference. James A. Farrell, president of the United States Steel Corporation, is named as the chairman, and all sections of the country, and practically all branches of industry, commerce, transportation and finance are represented among the members.

Outlining the purpose of the council, Mr. Farrell said:

"The next great era in the economic development of the United States will be the extension of our foreign trade, and the formation of the Foreign Trade Council is a necessary preparation for this evolution in our business life. By gathering active and representative business men into such a body and co-operating with all elements in our overseas commerce it is hoped to encourage every practical and sound policy designed to secure for us our share of the trade of the world's markets. The foreign trade of the United States is now valued at four-and-a-half billion dollars a year, of which two-and-a-half billion dollars represent exports. This trade has developed largely by reason of our natural resources and the individual enterprise of American industry, but without an American merchant marine, comprehensive national policy or commercial and industrial co-operation. The foreign trade is important as affecting American industrial enterprise and labor at home. On the other hand, it is not large enough to absorb all our manufacturing potentialities."

The National Foreign Trade Convention at Washington, which was attended by 341 delegates, representing seventy-two manufacturers' associations, chambers of commerce and other commercial and industrial organizations, showed that American manufacturers, merchants, railroad and shipping interests earnestly desire a more systematic development of the foreign trade, through creation of a merchant marine, establishment of American banks abroad and governmental co-operation in foreign trade. The convention unanimously adopted a resolution declaring that "the development of the United States makes it essential to the best interests of the nation that the Government and industrial, commercial, transportation and financial interests should cooperate in an endeavor to extend our foreign trade." This will be the purpose of the National Foreign Trade Council. Greater prosperity through greater foreign trade is the basic principle of the movement.

Robert H. Patchin, formerly Washington correspondent of the New York Herald, has been appointed secretary of the council, with temporary offices at 71 Broadway, New York.

CONSUMPTION OF A PULP MILL.

According to a calculation published by the "Papier Zeitung" a pulp plant requires two cords of wood to the ton of pulp as well as an aggregate of one half ton of sulphur, coal and lime to the ton of manufactured product. The consumption of horse power per ton of pulp is estimated at 6 to 10 h.p. in 24 hours.

The Influence of the Addition of Hedychium Pulp to Chemical and Mechanical Wood Pulps Upon the Physical Qualities of Paper Produced Therefrom

By CLAYTON BEADLE and HENRY P. STEVENS.

Hitherto, in the various published investigations on the subject of Hedychium coronarium, the results recorded have to do with papers of various kinds, qualities, and substances made the fibre alone or, in some few instances, with the addition of clay. No results have been published with a view to ascertaining the effects of using Hedychium coronarium in admixture with other papermaking fibres. In a paper mill where a commercial trial was made of Hedychium coronarium paper of the strong Manila quality, it was decided, subsequent to the production of the Manila paper, to mix some of the beaten Hedychium coronarium pulp with long-fibre sulphite pulp. This gave rise to a very strong paper possessing qualities somewhere intermediate between those of strong sulphite and strong Manila. As Hedychium has the property of self-sizing pulp, we thought it would be as well to ascertain whether it imparts these self-sizing qualities to other fibres when used in admixture with them. Also, whether, on the addition of considerable quantities of clay, the paper still retained its sizing qualities.

Certain physical qualities of clay loaded Hedychium papers have recently been dealt with in "The Effects of Mineral Loading upon the Physical Qualities of 'Hedychium' Paper," Journ. Soc. Dyers and Colourists, March, 1914, xxx., No. 3), at considerable length. Clay loaded Hedychium papers of the percentage compositions given in Table A were examined to ascertain how far they remained inkproof. It is well known that all ordinary fibres, in order to render them inkproof, have to be sized with rosin (or gelatin), and that the addition of clay calls for an increased consumption of rosin in proportion to the amount of clay retained, that is if the loaded papers are to retain as great an inkproof quality as that of the unloaded.

Table A.

No.	Date.	Hedychium.	Clay.
1.	December 16, 1913.	100.0	0.0
2.	"	91.5	8.5
3.	"	85.0	15.0
4.	"	82.7	17.3
5.	"	73.2	26.8
6.	"	68.6	31.2
7.	"	57.7	42.3

No. 1, consisting of Hedychium and containing no loading, behaves towards ink very much like a strong Manila paper, that is, a broad ink mark showed the liability of repelling the ink on the surface somewhat. The same liability is to be noticed with some very hard tub sized papers. This is a general indication of hard sizing.

No. 2, which contains 8.5 per cent. of clay, behaves very similarly, but repels the ink on surface in a somewhat less degree.

No. 3 also, although in the case of 3 the ink spreads in a more normal fashion.

All these are very resistant to ink penetration.

No. 4, containing 17 per cent. of clay, shows great resistance of penetration of ink, but the ink spreads on the surface in a uniform manner more like that of a

normal paper, and the same may be said of Nos. 5 and 6.

No. 7, which contains 42 per cent. of loading, which is an exceedingly high percentage, and with ordinary paper stock would require a large amount of rosin in order to render it properly inkproof, does not show the least penetration to the other side for ordinary substances, and, when Stephens' blue-black ink is used, which we use as a standard, shows practically uniform spreading on the surface and no appearance whatever of penetration to the other side for normal thickness.

Table B.

Composition.		Bursting strain in lbs. per square inch.	
Hedychium.	Mechanical A or chemical B.	A.	B.
Per cent.	Per cent.		
100	0	64.5	58.3
90	10	65.0	67.0
80	20	63.0	63.0
70	30	65.0	60.3
60	40	60.1	68.3
50	50	55.0	70.0
40	60	50.0	66.1
30	70	44.0	66.6
20	80	38.6	58.1
10	90	31.0	61.4
—	100	29.0	54.6

These results, therefore, show that the influence of the parenchyma cells of the Hedychium is so great as to enable papers to be loaded with clay up to the extent of 40 per cent without breaking down the self-sizing qualities. This is in itself a valuable property. It must not furthermore be lost sight of that with most paper-making fibres it would be practically impossible to retain such a large percentage of clay, even with the aid of rosin sizing.

Mixtures of Hedychium pulp and mechanical wood pulp were made of compositions as per Table B. Similar mixtures were made of Hedychium pulp and chemical wood pulp. Papers were made from each of them and carefully tested by ink tests. Papers prepared from the Hedychium mechanical mixtures were also tested by ink tests. Down to mixtures containing 60 per cent Hedychium and 40 per cent. mechanical wood, there was no appearance whatever of penetration or spreading upon the surface. In fact such mixtures appear to behave, as regards ink bearing and ink spreading, in the same manner as 100 per cent. Hedychium. At 50 per cent. Hedychium and 50 per cent. mechanical wood there is a slight disposition to spreading laterally, i. e., at right angles to the ink mark, in feathers upon the surface but with practically no penetration. At 40 per cent. Hedychium and 60 per cent. mechanical wood the feathery spread on the surface is augmented. At 30 per cent. Hedychium and 70 per cent. mechanical wood the ink penetration to the other surface is distinctly marked, and both the feathering and the penetration increase with increased quantities of mechanical; thus 80 per cent. mechanical more so

than 70, and 90 per cent. more so than 80 per cent., and, of course, 100 per cent. mechanical is quite soft and liable to immediate penetration.

Taking the case of Hedychium-chemical wood pulp mixtures when tested in a similar manner to the above show very surprising results. All of them show no spreading and no penetration. The breaking down in ink bearing qualities is between the paper showing 10 per cent. Hedychium and 90 per cent. chemical wood, and the 100 per cent. chemical wood paper.

It is evident, therefore, that not only has Hedychium when in admixture with clay, mechanical and chemical wood, marked strength-giving and such like qualities, but it acts as a sizing agent as well as a mineral retainer, and the proportion necessary to produce self-sizing will depend not only upon the proportions (percentage compositions) of Hedychium with these other substances, but upon the nature of the substances with which it is mixed. Thus with chemical wood-pulp, a small amount of Hedychium only, such as 10 per cent., is sufficient to produce self-sizing; with mechanical it is at least 50 per cent., and perhaps somewhere about the same proportion with clay.

Table B is also intended to show the influence of admixture of Hedychium with (a) mechanical or (b) chemical wood pulp upon the bursting strain of the papers produced. The first two columns indicate the compositions, the third column relates to (a) mechanical, and the fourth to (b) chemical. The bursting strain is expressed in lbs. per square inch and, for purposes of comparison, is reduced to a standard substance. Each result given in the table is a mean of ten tests. Attempts are always made in such trials to arrive at a uniform substance so as to avoid any further calculations, but where they differ from uniform substances they are calculated to a uniform substance.

Tests were also made (not given in table) of the breaking length of these papers. The results as regards breaking length do not indicate anything particularly striking.

Hedychium for these purposes is beaten fairly short in order to make it operate more as an agglutinating agent than as a fibrous material, and, in each case of, that used in admixture with chemical wood, it was so beaten that the bursting strain of 100 per cent. Hedychium was made to correspond as nearly as possible with the bursting strain of 100 per cent. chemical. Taking the case of the bursting strain of the Hedychium-mechanical mixtures, it will be noticed that the 100 per cent. Hedychium has more than doubled the bursting strain of the 100 per cent. mechanical. From the results of the top members of the series, there is no evidence of diminution in the bursting strain until the composition arrives at some where between 70 per cent. and 60 per cent. Hedychium and 30 per cent. to 40 per cent. mechanical. After this point as the percentage of mechanical increases so the bursting strain diminishes.

Hedychium is a pulp which stands the admixture of a certain proportion of other material much inferior to itself without showing deterioration, at least so far as bursting strain is concerned. This is borne out in the Hedychium-mechanical mixtures, it has been observed in cases of admixture with clay, and it is also borne out when one comes to look at the figures obtained with admixtures of Hedychium and chemical wood pulp in which the unmixed chemical wood is only slightly inferior to the unmixed Hedychium. Here it

will be observed that, from 100 per cent. Hedychium up to 50 per cent. Hedychium and 50 per cent. chemical, there is a distinct rise in bursting strain, 100 per cent. Hedychium being 58 and the 50 per cent. being 70, after which there is a distinct fall. We can only account for these results by assuming that there is in the normal Hedychium pulp a surplus of parenchyma cells, that is, more than is required for giving to the Hedychium fibres proper their necessary strength and self-sizing qualities, so that on the addition thereto of any foreign fibre a mixture may be obtained which possesses greater strength or greater bursting strain than the strength giving constituent, namely, the Hedychium. This is a distinctly valuable property, especially in cases where it is desired to blend Hedychium with other paper-making fibres. Not only is this property to be noted so far as the bursting strain is concerned, but also the breaking length. Thus the mean breaking length of the unmixed Hedychium and chemical, that is, when each unmixed paper is tested and the mean taken for both, is 4.5 kilometres. One would assume in the ordinary course of events that all mixtures of the two would fall somewhere between the figure obtained for the unmixed Hedychium and that obtained for the unmixed mechanical. As a matter of fact, the unmixed Hedychium shows 4.0 kilometres breaking strain, and that containing 80 per cent. Hedychium and 20 per cent. chemical is 6.0 kilometres. Therefore much stronger paper is obtained by mixing the two than from either of the constituents separately. We wish, however, to point out that far stronger papers are obtainable alone than any of those recorded above when the material is suitably beaten for the purpose, i. e., when Hedychium is beaten for long and hairy papers or krafts. Thus the greatest strength so far obtained is somewhere between 10 and 11 kilometres. The Hedychium pulp here used is prepared in such a way as to act as an agglutinating, compacting, and self-sizing agent, and as a mineral retainer. At the same time in some respects it possesses qualities which are quite equal to those of the strong krafts. When, however, the Hedychium and chemical pulps are blended with large proportions of chemical, as, say, equal weights of each, although the bursting strain is very high, the breaking length found is almost exactly that calculated, the observed being 4.77 kilometres and the calculated 4.5 kilometres.

When a fibre is investigated for the first time it is desirable to examine the qualities of paper producible from it without admixture with other fibres, but inasmuch as the qualities of mixture cannot be inferred and the paper maker works mostly with blended fibres, it is important as a further step to test the qualities of various mixtures. This communication is for the purpose of recording the influence of such mixtures.

R. H. CAMPBELL IS HONORED.

Toronto, Ont., July 20.—R. H. Campbell, Superintendent of Forestry for the Dominion, was signally honored by being made an honorary member of the Royal Scottish Arboriculture Society, which honor was conferred upon him at the diamond jubilee conference of the society at Edinburgh. Mr. Campbell in replying, referred to the keen interest which the Canadian Government had displayed in regard to forestry work throughout the Dominion.

Saw Mill Refuse and the Pulp and Paper Industry

By G. B. STEFFANSON.

(Written Specially for Pulp & Paper Magazine.)

Many a saw mill owner regrets that he has to stand the cost of conveying wood refuse, which cannot by any means be disposed of for the raising of necessary power for the saw mill, to a place where it can conveniently be burnt or otherwise destroyed.

He, however seldom realizes that the refuse has a commercial value as fuel for steam raising, if his saw mill is located in a reasonable distance from a place or places where power is used and cheap water power or a local natural resource of fuel is not available.

Hundreds of power plants throughout the Dominion use imported coal for fuel, though in the vicinity an abundance of wood waste is destroyed.

mills do not belong to the same concern, it usually so happens that the saw mill goes on destroying its wood refuse, and the pulp and paper mill buys imported and expensive coal for fuel.

THE VALUE OF SAW MILL REFUSE AS A FUEL FOR STEAM RAISING IS NOT FULLY REALIZED AMONGST PULP AND PAPER MANUFACTURERS.

One of the main reasons for this is, that only in recent years, ovens have been designed, which in an economical way utilize even low grade saw mill refuse, without being too expensive in first cost and in upkeep.

Ovens have been designed along many different lines, gas generating, stoker arrangements for direct firing under the boiler, and so on, and more or less fancy designs of Dutch ovens have been tried.

The best oven as yet designed for the utilization of this kind of fuel is undoubtedly the Half Gas Furnace.

This furnace or oven is not very cheap in first cost, and it takes some experience even for a bricklayer, competent on fire brick work, to build it.

This is undoubtedly one of the main reasons why this kind of oven has not quickly found its way throughout the parts of the world where saw mill refuse is available.

Ovens of this kind will be burned out in two or three months if built by an incompetent brick layer, and of inferior material, whereas an oven built right and of the right kind of material and properly looked after, should stand for eighteen months to two years, going night and day.

Only high grade fine-grained fire brick, true in angle and with sharp corners should be used, and for the arches bricks of the right shape are most essential.

The bricks should before setting be ground well together, in order to get a tight fit. A thin mortar of equal parts of unburnt fire clay, and burnt crushed fire brick or quartz sand all well sifted, should be used. An even, thin layer of the mortar should be evenly spread over the joint surface of the brick, and this worked down in its place as close as possible to get the smallest possible joints. This is a very essential thing, as the temperature is very high, especially in the upper part of a half gas oven and the heat eats out a wide joint much quicker than it burns good fire brick, thus exposing two sides of the brick to the fire.

Fig. 1 shows a longitudinal cut elevation of a half gas oven, attached to a Lancashire boiler of 1,000 sq. ft. heating surface 100 H.P. Fig. 2 shows a cross-cut elevation at the feed holes, and Fig. 3 shows a cross-cut elevation in the middle of the oven. Mark the difference between the width of the fuel room and the width of the grates. Figs. 2 and 3.

The fuel is admitted through the two feed holes at A. These holes should be well covered over by fuel or by lids, in order not to admit an excess of air this way. The grates are built as ordinary coal grates or as step or extension grates, this latter especially where sawdust is burnt as well, and in order not to allow any of the fuel to escape to the ash pit unburnt.

The grates should be kept well covered with fuel in the lower part of the oven and to accomplish this the

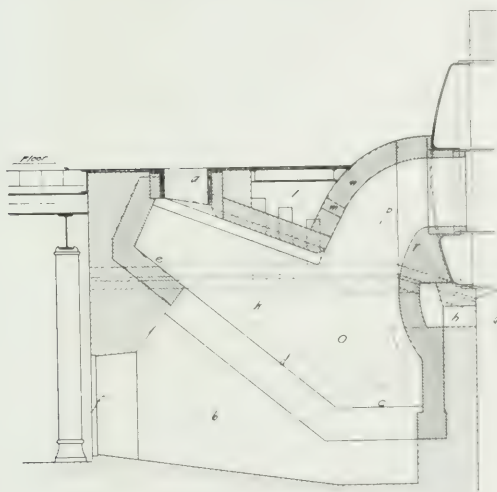


Fig 1

The average saw mill refuse has not a large value as fuel, if weight and bulk are taken into consideration, if rightly handled it can, however, be shipped, both by water and by rail for a considerable distance to the advantage of the seller as well as of the customer.

Here the Railway Commissioners as well as the railway companies could help the industry in general by granting low local rates, this would soon add to the tonnage, and even if not giving a direct income, would bring down the railroad's local tonnage cost, and thus give an indirect income to the railway companies. Suitable cars would, however, have to be provided.

The sawdust is usually more than sufficient for the raising of the power, necessary in the sawmill using ordinary Dutch ovens. By using more efficient ovens much more than the necessary power could be raised for sale or some of the sawdust could be sold to other steam raisers.

Pulp and paper mills are, as a rule, located near saw mills, as they both have the same source for the supply of their main raw material; still, if the two

upper part should at all times be kept full of fuel. The horizontal ash grate (e) is especially liable to lay bare, if the fuel is not poked down from time to time. The inclination of the grates could be made larger, in order to have the fuel to fall down and cover this horizontal grate without any extra work, this, however, makes it more difficult to remove the ashes from this grate, where they mostly collect. This ash grate should preferably be of the swivel type and so arranged that it can be operated from outside the oven.

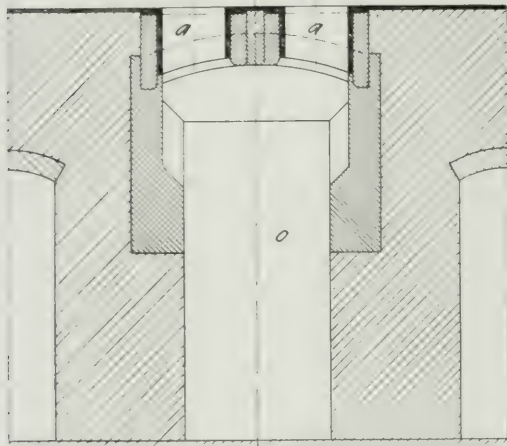


Fig. II

The prolongation (c) of the grates serves to receive the fuel and by this arrangement a considerable quantity of fuel not on fire, will prevent an excess of air from entering the furnace, even if the lid is off.

The ash pit door (f) is provided with small dampers regulated from the main floor, and large enough to admit sufficient air for a partial combustion, or rather for the forming of combustionable gases.

A canal (g) is provided for behind the furnace and under the front part of the boiler to accommodate blow-off pipes. From this large canal two secondary air canals (h) one on each side of the furnace, lead to the side canals (k) from these to the room (l) above the furnace chamber and through the holes (m) in the arch (n). The air is heated when passing the canals (k) and to the room (l).

The combustible gases from the furnace (a) pass up through the canal (p) where they are thoroughly mixed with the hot secondary air coming through the holes (m). Complete combustion therefore takes place just before the gases enter the fire tubes, thus giving most of its initial heat to the front part of the fire tubes, not to the brick work outside, nor to the inner end of the fire tubes, which latter means a considerable lowering of the capacity of the boiler.

When lining the furnace with fire brick linings extending from the front into the boiler work, behind, should be provided for all canals (k). This in order to prevent the fire brick lining to fall out when it is burnt thin. It may take over a few weeks to burn out half of the thickness of the lining, but this saves the fire gets to the usual outer side of the lining, the longer time will take it to burn the lining away, and a thin flue of lining

may resist the action of fire for many months if it is properly stayed so that it cannot be pressed out by the light pressure of the fuel.

The fire bridge at (r) is very much exposed to the fire and in order to prolong its life it is wise to provide same with a canal through which air circulates.

Experiments have shown that the grate area should be about one one-hundredth of the heating surface in a plant where the draught is about one and one-quarter inches of water at the bottom of the chimney and an economiser is installed and consequently the draught at the gas inlet to the boiler is about one-half inch of water.

A larger grate area proved to combust too much of the fuel instead of transforming it into combustible gases, if the boiler was not pressed very hard, when a large loss of heat in the fuel gas occurred. A smaller grate area lowered the capacity of the boiler considerably under normal working capacity.

The grate area should, for plants of above description, but without economisers, be from 15 to 20 per cent smaller, not to let the gases escape from the boiler at too high a temperature.

In boiler plants where the draught is low, consider-

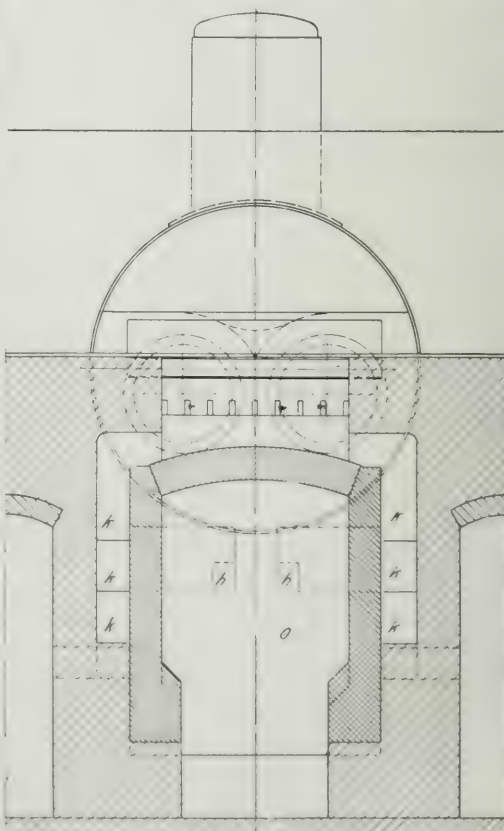


Fig. III

ably larger grate area has to be provided for, and the furnace so built that the fuel does not resist the direct air too much. The secondary air canals should not be

too long, and all corners should be well rounded so as not to prevent a sufficient quantity of air to pass through.

Minute air regulation arrangements should be provided for in order to get the right composition of the combustible gases and not too high percentage of surplus hot air admitted into the combustion chamber.

The arches should be provided with peep holes through which the combustible gases and the combustion can be watched. The fireman will soon be able to judge from the color of the flame, how to regulate the different air inlets, especially if he has a combustion recorder to aid him.

Also ordinary Dutch ovens can conveniently be rebuilt to half-gas ovens, care should, however, be taken that the design is such that the secondary air is thoroughly mixed with the combustible gases.

The following tests were made on the furnace described above, and they do to some extent indicate the value of different kinds of refuse as fuel.

Test No.	1	2	3	4
Duration of test hrs.	4	4	4	4
Quality of fuel see below	1a	2a	3a	4a
Quantity of fuel lbs.	6,406	5,496	11,717	18,315
Evaporated during test: lbs. of water	28,263	14,929	28,354	22,037
Pressure aver. during test: lbs. per sq. in.	93.1	90.6	94.2	90.4
Feed water from economiser	231	228	244	274
Evaporation per sq. ft. heating surface.	6.9	3.6	6.9	5.4
Lbs. of steam per lbs. of fuel, from 32 degrees F. water to steam of boiler pressure	3.67	2.27	1.99	0.95

Quality of Fuel.

1a.—Refuse from wood room and planing mill 74.6 per cent bone dry.

2a.—Sawdust 45.5 per cent dry.

3a.—Cut up edgings and slabs stored for 6 months. 69.2 per cent bone dry.

4a.—Cut up edgings and slabs sawed in winter time and with ice on. 41.9 per cent bone dry.

BELGO DEVELOPMENTS.

The Belgo-Canadian Pulp and Paper Company's mill at Shawinigan Falls, Que., is undergoing extensive alterations and additions. The new sulphite plant is being rapidly constructed, the second digester, being about one-third complete. In the magnificent modern building which has been built to accommodate stock, machine plant, screens and offices, the very finest equipment is to be seen.

A general speeding-up is being undertaken. One machine has been temporarily shut down in order to increase the rate of production to 605 feet a minute, and the other machines are to be worked to capacity. In the near future, when the new machine shop is complete, the old shop will be thrown in with the plant as part of the paper machine room, and the production of the concern considerably increased.

Mr. H. Biermans, the General Manager, has just left on an extended trip to Europe, leaving complete authority over both construction and manufacturing ends with Mr. J. Stadler, the Assistant Manager and Chief Engineer.

Trade Inquiries

Mr. F. Daw, Trade Commissioner in Glasgow, reports that several inquiries have been made for fibre board and wall board, and evidence of interest is shown by firms interviewed, who express a desire to see samples with full particulars as to the uses, and conditions of packing, together with quotations in sterling c.i.f.

Roofing Material.

Felt roofing material is an article in common use in Britain, as is also the case with other forms of patent roofing material sold under different names, or brands. Considerable quantities are imported from Germany. A number of firms have expressed a desire to ascertain what is manufactured in Canada, in the hope that business can be opened up. It is desirable when offers are made from Canada, to place very full particulars before buyers as to the style of package, quantity, etc., if possible quoting on a c.i.f. basis, also stating if goods can be manufactured to certain requirements of this market as regards width and length.

The Department of Trade and Commerce has received numerous inquiries regarding Canadian pulp and paper products. The names of the firms making these inquiries, with their addresses can be obtained only by those specially interested in the respective commodities upon application to the Inquiries Branch, the Department of Trade and Commerce, Ottawa.

652.—Paper, Wrapping.—Samples and prices are asked for by a South African firm.

653.—Paper, Bags.—Samples and prices are asked for by a South African firm.

686.—Paper, Wrapping.—Samples with f.o.b. prices are asked for by a South African importer.

687.—Paper Bags.—Samples and f.o.b. prices are asked for by a South African merchant.

694.—Representative.—A Paris broker would gladly accept to represent in France any manufacturer or producer who may desire to open up trade.

705.—Pulp and Paper.—British house, old-established, of highest standing with first-class references, wants agency of good pulp and paper mills, cash advances and financial facilities granted.

711.—Wrapping and Toilet Paper.—A Havana firm of commission merchants is open to represent first-class Canadian manufacturers of wrapping and toilet paper.

ANOTHER PAPER MILL?

Special to Pulp and Paper Magazine.

Fort Frances, Ont., July 23rd.

A big real estate deal recently took place which will net the owner, Mr. Wm. Phair, a nice little amount. The property sold is all the vacant land as well as the lots where Mr. Phair resides, situated south of the Williams and Phair blocks and extending to Nelson Street. The Ontario and Minnesota Power Company are the purchasers. Just what Mr. Backus will do with it is not known, but Mr. Phair says that he believes that the company secured the land on which to build another paper mill. The purchase price is said to be \$20,000. The fact that the Power Company through Mr. Backus has purchased this property would seem to indicate that more development work of some kind is being projected by Mr. Backus. The building of another mill has long been contemplated and if Mr. Backus receives proper encouragement and assistance from the town, he says that he will build a couple of more large mills.

Who's Who in the Canadian Paper Industry

S. F. Duncan, Secretary-Treasurer, St. Lawrence Paper Mills Company.

By W. A. CRAICK.

Fred Duncan is one of those quiet, steady-going chaps who is perfectly convinced in his own mind that he has never done anything worth talking about in print. However, that all depends on the standard one adopts in measuring achievement. It is quite true that he may not have done anything very spectacular so far in his career, but he has forged ahead far enough in the comparatively few years he has been at work to prove that he has some of the qualities in his make-up that spell success.

Duncan was secretary-treasurer and general utility man for the Bryant Paper Company in Kalamazoo,



Michigan, when "Ike" Weldon used to blow in from the east in the interests of the Burgess Sulphite Company of Boston. "Ike" did the selling and "Fred" the buying and the pair struck up a warm friendship. The former sized up the latter as a downright capable office man; the latter reciprocated by putting all his confidence in the former as a "comer." Between these two opinions they ultimately came together on the deal by which both have to-day sailed into prominence in the Canadian paper industry.

It is a coincidence worth recording that both the president and the secretary-treasurer of the St. Lawrence Paper Mills Co. were born and brought up on the farm. Mr. Duncan first saw the light at a place called Schumcraft in Kalamazoo County, Michigan, so he has at least one advantage over his Canadian-born colleague in that he is eligible for the U.S. Presidency. His parents were Americans, with probably a distant Scottish connection. He spent his first nineteen years alternately on the farm and at school, including a variety of knowledge both theoretical and practical. His aptitude, probably in mathematics, led to the more useful task of inheriting a corn. Then like thousands of other famous sons, he was turned to the more ex-

citing and pleasurable life of the town. Kalamazoo was of course "the city" for that part of the state, and thither young Duncan journeyed one morning with his belongings packed in an old family trunk.

Possibly through parental influence, he got his first job in the establishment of D. C. & H. C. Reed & Co., who were engaged in the laudable undertaking of making farm implements. His work was in the shipping room where the duties of shipping clerk were imposed on him. This connection lasted between three and four years and then a new opening attracted him. A man by the name of Bryant was engaged in starting a paper manufacturing industry in Kalamazoo in the summer of 1896. He wanted a capable male stenographer; Duncan applied for the job and was accepted. From then until he severed his connection with the company in 1909, the one-time shipping clerk went ahead just about as fast as the industry itself.

The young man was about as steady and regular as a clock. To a machine-like attention to details he added an alert mind and capable faculties. He came by degrees to be depended on for carrying out executive orders. From stenographer he was promoted to bookkeeper and from bookkeeper to secretary-treasurer. The industry which had been started with a single paper machine was enlarged from time to time until, when Mr. Duncan left, it was running seven machines and twenty coating machines and was generally regarded as one of the most successful paper companies in the United States.

When the secretary-treasurer of the St. Lawrence Paper Mills Co. first came to Canada he was stationed at Cornwall in order to be near the scene of operations at the Mille Roches plant. Here he remained until about a year ago when he removed to Toronto and put his desk in the small private office of President Weldon. The pair are now in such close touch that they can, if necessary, shake hands without rising from their chairs, a proximity which must be useful when important policies are under consideration.

Mr. Duncan is a tall, slight young man, very deliberate in his actions, of a thoughtful cast of features, and a reputedly hard worker. In his manner and habits he may perhaps best be described as old-fashioned. There is absolutely no side about him. He is just a plain, steady-going office man, with a fondness for his pipe, whose day's work forms his most engrossing hobby. He doesn't go in for much fun after business hours. While he drives a motor, he isn't daft over motoring. He has been known to go fishing occasionally and also to do a little hunting in the season. He has even been induced to try his hand at lawn bowling, but these are in the nature of distractions and form as yet no regular part of his routine.

Though Mr. Duncan is not a practical papermaker, he has been long enough in the business to have absorbed a good deal of the technical knowledge of the trade. He is naturally apt with his hands and could doubtless operate a machine satisfactorily if given his time. Better than this, however, is that combined office and factory knowledge which tends towards economic production. Mr. Duncan possesses this in marked degree and this is one direction at least in which he is proving of value to his associates. He pays regular visits to the company's plants and is in close touch with their operation. In addition to his connection with the St. Lawrence Paper Mills Company, he is treasurer of the Barber Paper and Coating Mills Company and secretary of the Inter-lake Tissue Mills. In the new Provincial Paper Mills Company, he holds the office of secretary-treasurer.

Correspondence

PAPER MAKING INDUSTRY IN SOUTH AFRICA.

Editor, Pulp and Paper Magazine:

Having observed the paragraph on above in your issue of 1st July and having some considerable knowledge of the possibilities of Paper Manufacture in South Africa from a special visit to that country to ascertain same, some years ago, I think it may be of interest to some of your readers to give a short summary of my experience there, and the conclusions I arrived at after a very careful examination of various localities and existing conditions.

Taking the consumption of paper first. Unquestionably there is an opening for a Mill making News Print and various grades of wrapping paper (say one machine for each to start with), but there is not sufficient demand for fine papers to call for a mill making either writings or book paper.

Regarding position for such a mill. My opinion is that, to be successful, it must be on or very near the coast, because wages are considerably lower than up country. Machinery and chemicals would cost considerably less at the mill. Materials could be collected cheaply from the various important coast towns and brought to mill almost entirely by sea. Again, by being on the coast, full advantages are obtained of what are called Colonial Produce Rates. These are special and very much reduced rates charged by the Government Railways on articles made in the country, as against the same articles imported. The full advantage of these rates would be obtained by being situated on the coast, and there would also be the advantage of water carriage to all the important coast towns.

Further, a mill would cost less to build on the coast, also, and this is an important matter in S. A., one would be free from pollution troubles. It must be remembered that water is none too plentiful in South Africa, and if a mill was situated on a river any distance up country, in the dry season when most of the rivers are mere dribbles, it would be quite a sure thing that every death among the cattle all the way down stream would be charged against the paper mill, and there would be continuous worry and expense over claims for damage and compensation.

Next comes the question of Power. First, it may at once be stated that water power is out of the question, simply because it is not to be had with any regularity at any accessible point. Therefore, we have to fall back on steam, which means coal. There is coal in Cape Colony, but it is a long way from the coast and the quality is certainly inferior. In Natal there is better coal, but here also it is a long way from the coast. In Zulu Land, just over the border of Natal, there is good steam coal in quantity and it is near the coast. This would seem to be the best source of fuel supply.

Next we come to the important point of Water Supply. Here I think we may dismiss Cape Colony, for there, although some considerable rivers are shown on the maps, there is very little water in them during the dry season and great floods in the wet season, which run off very rapidly indeed.

In Natal there is not nearly so much variation in the flow of the rivers and sites could be obtained on the coast there with railway accommodation, and ample supply of manufacturing water of good quality can be obtained all the year round.

Now comes the question of Material. It is an accepted fact that paper can be most profitably made from

articles which are of practically no use for any other purpose.

In South Africa the waste of all the towns is simply collected and burned. Among this waste are large quantities of various grades of good papermaking material, such as rags, ropes, canvas bagging and waste papers. All these could be obtained for little more than the cost of collection and freight to mill. But this source, although very valuable, could not be relied upon entirely for the supply of sufficient raw material to keep even a medium-sized mill in full work; therefore, it is necessary to look round for some natural fibre.

In the paragraph in your last issue Veldt grass is referred to. This the writer tested thoroughly some years ago, both personally and by a leading chemist, but the verdict was that it was not so good as Esparto, as far as fibre went, and the yield of fibre per ton of dry grass was considerably less. Besides, the cost of collecting was so heavy as to put it out of consideration altogether. There are many fibres growing in South Africa which would make paper, but they are with two exceptions—not in sufficient quantity, or they cost too much to collect.

The first of these fibres is the sugar cane waste from the sugar factories in Natal: this is called Megrass or Bagasse. It is used for fuel by these factories, but the proprietors would gladly substitute coal for this waste if they could get rid of it for some other purpose at its fuel value. There are large quantities of this produced in a comparatively small area.

It is well known that this material has been experimented with in various places, and not, so far as we know, with great success. In the writer's opinion the trouble is—that in sugar cane countries, other than Natal, the crushing season is over in six weeks or so, while in Natal the crushing goes on for about nine months. From the writer's experience in handling Megrass, it is necessary, if a good white pulp is to be obtained, to get the material fresh from the crushing mill; otherwise it will not come to a direct color, with any reasonable percentage of bleach. Presumably, the residue of sugar left in the crushed cane ferments and turns the fibre brown in such a way that it cannot be bleached economically and therefore the resultant pulp is only fit for use in brown papers.

This Megrass, when handled fresh from the crushers, is more easily boiled than Esparto and certainly no more difficult to bleach.

The second fibre is the Papyrus reed; it grows in large quantities on the Zululand coast, just over the Natal border, and between the railway and the sea. This reed is just right for cutting when the Megrass season is over, and it can be easily and cheaply collected. To reduce it to pulp, the same machinery and process as that used for Megrass would be suitable.

We now come to the question of Labour. In Cape Colony unskilled labour is costly, and none of the native tribes have so far taken kindly to factory work, but in Natal, while the same remark applies to the natives, there is a large population of Indians of the Coolie class who work in the cane fields. They are cheap and easily taught routine work. Wherever a mill was built the skilled labour would require to be imported, but as the cost of living is much less on the coast than up country it follows that the rate of wages is lowest on the coast.

Lime, which is a very necessary article if boiling is done by soda process, is obtainable, of the very highest quality, made from pure white marble, obtainable near Durban. There are also said to be deposits of that

useful article, China Clay, and there is plenty oehre if required for coloring or loading purposes.

Mill buildings in South Africa need not be costly, as the climate is such that little more is needed than sufficient to protect machinery and workers from sun, wind and rain.

Anyone starting a paper mill in South Africa might have every confidence in getting all the help and assistance that the government could give them. Indeed, in Natal there is a law offering quite a considerable bonus to the first person starting a paper mill and making a comparatively small amount of paper within a year of starting.

In conclusion, the above is simply a plain statement of facts as ascertained by personal observation and enquiry from all sorts of people on the spot. The writer is quite of opinion that there is a good opening for a paper mill in South Africa and he, knowing the conditions, has often been surprised that one has not been started before. The best place to start would, in the writer's opinion, be on the coast line of Natal, near Durban.

ALEX. ANNANDALE.

Ascertaining The Machine Direction of Paper

SINDALL and BACON in *The Paper Makers' Monthly Journal*.

There are several methods for determining the machine and cross directions of paper, and it seems almost impossible to find anything really new to say about the subject. At the same time, a summary of the various methods in use may be of convenience to our readers who desire to compare one method with another.

With thin printing papers made from esparto it is not a difficult matter to detect the machine direction by the appearance of the paper when a sheet is interposed between the observer and a strong light. In such cases the wire marks are very prominent, and the sheet appears to be dotted all over with diamonds. The sharp pointed angles all point in the machine direction, while the more obtuse angles show the cross direction.

With very coarse papers, and with mottled papers, the surface appearance of the paper can be relied on to a very large extent as indicating the machine direction. The parallelism of the fibres is very distinctly marked, especially in mottled papers. It is quite simple to determine not only the machine direction of the paper, but also the under side of the sheet. The mottled fibres are never more parallel to one another in the machine on the under side of the sheet than on the top, so where the shadow of the wire has exercised a greater influence on the disposition of the fibres.

With coarse heavy paper the same conditions hold, and the direction of the fibres is easily determined with these. A closeness of the fibres nearly always appears in cheap papers due to the formation of apparent stripes in the sheet. This may largely be traced to the direct condition of the machine wires.

The easiest use of a circular piece of paper when the latter is dropped on one side is perhaps one of the most useful and sure when it is most frequently applied. The use of the little tube into which the paper is inserted by the expansion of the fibres due to clamping indicates the machine direction of the paper.

Nickel's method of placing two strips of equal length on one another, and holding them in the air between the finger and thumb, is perhaps the most ingenious. This method has been illustrated in all text books, and no detailed description is needed. If the under strip is strong enough to support the top strip, it indicates the machine or stronger direction of the paper.

Resz some years ago published a simple method based on the unequal expansion of the paper in the two directions when dipped into water. The principle involved is the same as that which operates in the case of the circular piece. It is claimed for this method that it has the advantage of being applicable to samples which must not be cut or destroyed. The edge of the sheet is dipped perpendicularly into water and immersed for about half a minute. The edge of the paper when cut in the cross direction rapidly assumes a very wavy appearance, whereas in the case of the machine direction the waviness is not so marked, if at all.

Frequently this behaviour of paper on damping can be taken advantage of by merely dipping a corner of the sheet itself into water so that at least an inch or an inch and a half along each edge is wetted. Close observation of the behavior of the two edges at the corner frequently indicates the machine direction of the paper.

The actual determination of the exact machine and cross directions in a sheet of paper is not always a matter of importance. Generally speaking, the paper is cut square or parallel to one of the directions, so that it is safe to assume for purposes of strength tests that the line of maximum strength is the machine direction. As a matter of interest we might mention that with certain classes of paper it becomes necessary to guard against the paper being cut at an angle so that the apparent square edges of the sheet are possibly at an angle of 45 degrees to the machine direction. One instance of this is to be found in paper used for envelopes. If it is assumed that one of the edges of such a sheet is strictly parallel either to the machine or cross direction, mistakes may occur. On the other hand, the mere fact that the strengths in the two directions under such an assumption are practically the same, should create the suspicion that the assumption is incorrect. A test for the machine direction would then have to be made in order to find the exact angle for maximum strength and minimum strength. If a number of strips are cut radiating from some common center and examined for strength, the position of the machine direction can be found by purely physical tests of tension, though we need hardly resort to such lengthy and cumbersome process in view of the simple and effective devices referred to above.

The action entered against the Spanish River Pulp and Paper Co., by the Rathbiff Paper Co., of Toronto, to recover the sum of \$25,000 for non performance of contract in connection with an order placed by the latter for some fourteen hundred tons of Manila No. 2 as well as a quantity of fibre and Manila No. 1 papers has been settled out of court. The paper was to have been manufactured at Sturgeon Falls plant and, after delivery of some 500 tons, no further shipments were forthcoming. The Rathbiff Paper Co. received in the neighborhood of \$10,000 in adjustment of their claim.

George Pawley and Co. have started in the business of wholesale paper merchants, at 1311 Queen Street West, Toronto, and are carrying a stock of wrapping, bags, twines, tulle, paper, blotter and pre plates. The sales manager of the company is James Dunlop.

Ottawa Notes

Ottawa, Ont., July 25.—As the result of a break in a flume wall over a week ago, three of the mills of the J. R. Booth lumber and paper manufacturing company are temporarily out of commission, and some 500 workmen are deprived of employment. The accident occurred from some weakness in the wall and as a result the saw and board mills and one of the pulp mills of the company stopped running, though No. 1 pulp mill, the paper mill and the sulphite mill were not affected and are still in operation. The damage is expected to be repaired within a week's time. The Booth plant has been rather unfortunate in the way of accidents during the past year, a number of them having occurred and one having nearly terminated the activities of Mr. J. R. Booth himself.

The Ottawa river is again beginning to drop after its recent sudden increase following the breaking of the Temiskaming dam, and the heavy rains which followed the spell of very dry weather. The fact that the dam at Temiskaming is now well on the way to repair and the flow of water through the gap in the big structure has been stopped is partly responsible for this. However, most of the mills have managed to get their logs down during the high level period. On the Gatineau River conditions are now reported to be very good. The recent rains have had more effect on this stream than on the Ottawa, and large booms of logs and pulpwood have been brought down during the past few weeks. It is stated by the mill owners who a few weeks ago were predicting a close-down, that they now have enough timber to keep them busy during the summer.

The part that its lumbermen and paper manufacturers play in the city of Ottawa's affairs, although the Capital has outgrown its former appellation of the "lumber town" is illustrated by the manner in which J. R. Booth stepped into the breach caused by the breakdown of the pumps at the city's waterworks a week ago. The accident left the city without fire pressure and without means of fighting fire to a certain extent, since to increase the pressure as much as possible all the available fire engines had been attached to the mains. Mr. Booth, however, arranged in case of emergency to close down his mills and use his power to supply an extra amount of four million gallons of water.

The Lake of the Woods Boom Company has given notice that it will shortly apply to the Government for approval of the plans and site of a boom which is to be built by the private interests represented in the bed of the Rainy River opposite the Wild Lands reserve. A number of lumber and pulp and paper companies are interested in the structure for which plans have already been filed with the Minister of Public Works at Ottawa.

By the middle of August between 35,000 and 40,000 men will be working in the lumber camps in the timber limits owned and operated by Ottawa Valley lumber and pulp and paper manufacturers. The firm of J. R. Booth will have close to 4,000 men working in about 35 camps. A good deal of spruce, much more than was cut last year, will be taken out this season.

Authority has been secured from the Department of the Interior by The William Caldwell Paper Com-

pany Ltd., to change the name to the Beveridge Paper Company, Ltd. The Canada Gazette has published the official notice of the incorporation of a new pulp and paper company with a capitalization of \$100,000 to be known as the Chateaux Bay Pulp and Paper Company Ltd. The head office of the company will be at at Sherbrooke, Que. MacCORMAC.

Pulp and Paper Conditions in Scandinavia

Mr. C. E. Sontum, Canadian Commercial Agent, says in his report of July 3rd, that according to an article, which has appeared in a number of papers, the directors for the Labro Wood Pulp Mill have made a contract, whereby this mill has sold some 400,000 tons of pulp in one deal. The above mill is owned by the city of Drammen, and is rented out to a stock company, whose contract has still 22 years left to run. The sale of pulp, which this company has just made to an English paper factory, embraces all the production of wood pulp, which the company will be making during the coming 22 years.

The sale price is based, it is stated, on the present cost of production, but the sellers have reserved for themselves the right to raise or lower the price, if the cost of production during the next 22 years should undergo any marked change. The mill employs at present about 80 hands, and the yearly production is calculated to be from 18,000 to 20,000 tons of moist pulp. The total amount of the contract is reported to be in the neighborhood of four million dollars.

In connection with the Centenary Exhibition of Norway now being held at Christiania, the Norwegian Wood Pulp Association, the Norwegian Cellulose Association and the Norwegian Paper Makers' Association have sent out a pamphlet which closes with the following estimate of conditions in this industry:

"The Norwegian wood pulp and paper industry has a capital of at least 100 million kroner (26.7 million dollars) and at present employs 11,000 working men. The products of these industries represent nearly one half the value of the industrial exports of the country. Circumstances, however, brought it about, that these lines of industry are laboring under even poorer working-conditions, and are finding it difficult to keep pace with the competition from other pulp and paper producing countries. The costs of production, especially the price of timber have been continually rising, while the price of the ready-made product has been declining. It is feared therefore that if conditions are not soon bettered, these industries will find it increasingly difficult to continue.

At Stjorden near the city of Drontheim there is a proposal to start a new pulp and paper mill at a cost of about 300,000 dollars and with a yearly capacity of 4,000 tons of 40 grammes printing paper and 6,000 tons of wood pulp. The most modern machinery will be used.

A strike has been going on for some time among the log sorters at Smölands sorting place in the Andersman river where some 800 men have struck work. As some ten million logs have to pass this sorting place each year, the importance of this strike may be realized. Five small saw-mills have already been compelled to stop work from want of logs, and if the stoppage lasts others will be compelled to follow suit, and it is feared that the entire business of the district will be dislocated. A similar conflict has also broken out in the Lyngga river by Strömsvall and it is feared that the strike may extend to the Indals river. Such a strike

at the sorting places if it is continued for some time may have the most serious influence upon the output of the Swedish sawing mills, since the logs cannot be brought down to the mills.

Large areas of forests are at present burning in the Oesterdalen, one of the best forest districts of Norway. Two hundred and fifty acres of valuable forest lands have already been destroyed. The fire was caused by sparks from a railway engine.

The Swedish Pulp Market.

The "Svensk Export" reports that the sales of sulphite are limited to only prompt deliveries. The late fall in the prices does not seem to have had any influence on the sales. The makers are of opinion that the United States ought to soon appear on the market as buyers. Contracts for delivery during 1915 are being discussed. The fall in the price of sulphite has caused some increased interest among the buyers. The mills have reduced their stocks of mechanical, though here also there is noticeable some interest among buyers.

Swedish Paper Industry.

Three of the largest paper mills in the midlands of Sweden have recently bought large areas of forests to a value of nearly 1½ million dollars. In this way the Swedish paper mills are trying to consolidate their future production.

WOOD PULP IMPORTS IN MAY.

(Special to Pulp and Paper Magazine.)

Washington, D.C., July 25th, 1914.

The monthly summary of the Department of Commercial Bureau of Foreign and Domestic Commerce, for the month of May, and for the eleven months ended May 31, 1914, has just been issued. This report shows total importations of wood pulp during May, 1914, into the United States of 89,214,185 lbs., valued at \$1,373,856. This is only a slight increase over the importations in May, 1913 (84,743,165 lbs., valued at \$1,367,794). Canada led the other countries in exporting wood pulp into the United States during this period. Of the total, her share was 43,224,037 lbs., valued at \$518,312. Of the total in May, 1913, Canada's share was 29,052,968 lbs., valued at \$344,731, which shows that the pro rate of increase from Canada was far greater than the general increase.

The distribution of the importation of pulp in May, 1913-1914 follows:

	1913.		1914.	
	Lbs.	Dollars.	Lbs.	Dollars.
Germany	11,722,716	215,848	16,396,163	285,732
Norway	23,718,428	480,201	14,641,327	300,339
Sweden	19,104,111	307,057	12,611,044	225,336
Canada	29,052,968	344,731	43,224,037	518,312
Other				
Countries	1,144,942	19,957	2,341,614	44,137
Total	84,743,165	1,367,794	89,214,185	1,373,856

For the eleven months ended May 31, 1914, the importations totalled 1,031,135,087 lbs., valued at \$15,378,411 which is compared with the corresponding periods of 1913 and 1912 respectively, as follows:—1,053,474,397 lbs., valued at \$15,102,138, and 981,062,962 lbs., valued at \$13,052,247. In each case Canada's share was greatly in excess of that of any other country, she imported during the eleven months in each year as follows:

	Valued at
1914	\$5,228,780
1913	\$4,528,780

1913 431,749,555 4,607,928

1912 429,550,915 4,353,655

Importations for the eleven months period of 1914 recorded Sweden second with 238,875,852 lbs., valued at \$3,935,355; Norway, third, with 164,781,015 lbs., valued at \$3,365,172, and Germany fourth, with 135,743,028 lbs., valued at \$2,447,193. The remaining importations consisting of 17,120,107 lbs., valued at \$301,911, came from several other smaller exporting countries.

The 89 million odd pounds of wood pulp brought in during May, 1914, consisted of 25,846,630 lbs. of mechanically ground wood valued at \$191,219; 45,898,527 lbs. of chemical unbleached valued at \$775,269; and 17,469,028 lbs. of chemical bleached, valued at \$407,368. All of these importations came in free of duty. Similar figures for the eleven months ended May 31, 1914, are:

	Lbs.	Valued at
Mechanically ground wood..	323,529,678	\$2,497,783
Chemical unbleached	546,408,621	9,110,592
Chemical bleached	161,196,788	3,769,036
Total	1,031,135,087	\$15,378,411

WAYAGAMACK PULP AND PAPER COMPANY.

Net profits of \$193,903 for the year ended June 30 last, were made by the Wayagamack Pulp and Paper Company. This compares with \$151,773 last year, a gain in 1913, therefore, of about 28 per cent over the profits of 1912. The report presented at the company's annual meeting last week, is the first in respect of a full year's working of the company's pulp mill, the statement to June 30, 1913, covering only six months' operation of this department, although representing a full year's lumbering activity.

The company's current liabilities on June 30, 1914, were \$879,065, as against \$436,959 on the same date a year ago, an increase of \$442,106. Liquid assets amounted to \$700,281, as against \$601,284 the previous year. The increase in current liabilities is due to an increase of \$372,151 in bank loans. Reserves against lumbering operations and contingencies stood at \$79,146 on June 30 last, as compared with \$168,266. Buildings, plant and machinery are held at \$2,432,656, an increase of \$354,872 over 1913.

The following table shows the profit and loss account as at June 30 of both years:

	1914.	1913.
Earnings for year	\$403,903	\$256,773
Bond interest	210,000	105,206
Net profits	\$193,903	\$151,773
Balance from previous year	151,773	.....
Balance at credit	\$345,677	\$151,773

The earnings for the year, after providing for all charges and expenses of administration, were \$403,903, as compared with \$256,773, an increase of \$147,130, but as bond interest in 1913-14 was double that of 1912-13, the net showing did not increase in proportion with the gross. The heavier interest obligations were due to an issue of \$500,000 of the company's bonds prior to the close of the first fiscal year. The balance at the credit of profit and loss, \$345,773, is about 6.90 per cent on the \$5,000,000 common stock outstanding.

In view of the industrial conditions prevailing, the report is a satisfactory one.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The American Paper and Pulp Association which for a number of years has been located at 50 Church Street, New York, has joined the uptown movement. New executive offices have been leased on the sixth floor of 18 East 41st Street. This movement is brought about by several reasons. First: quarters in the close vicinity of the Grand Central station would be much more convenient to its members, and second, the Erie R.R. Company has been desirous for some time past of securing the suite now occupied by the association in the Hudson Terminal. The association has subsequently sub-leased this space to the Erie R.R. The paper trade started the uptown movement several years ago. Among the larger concerns now located in the Grand Central district are: Great Northern Paper Co., Manufacturers Paper Co., Grand Lake Company, Perkins-Goodwin Company, M. Gottesman and Son, and Mileson Rantoul and Company.

The Jassup and Moore Paper Company with six paper and pulp mills and offices in New York, Philadelphia, Boston, Elkton, Md., and Wilmington, has been incorporated under the laws of Massachusetts with a capital of \$3,000,000, consisting of 10,000 shares of 7 per cent. cumulative first preferred, 7,500 shares of 7 per cent. cumulative second preferred and 12,500 shares of common stock. The incorporators are G. Barker, P. E. Atkinson, I. V. Brock, A. C. Gould, E. C. Fisher, G. R. Merrill and W. J. Martin.

The real estate includes the Augustine Mills, Wilmington, Del.; the Rockland Mills and Delaware Soda Fibre Pulp Mills, Christiana Hundred, Del.; Chester Mills, Coatesville, Pa., Radnor Pulp Mills, Elkton, Md., and Kenmore Paper Mills, Providence, Md.

A meeting of the unsecured creditors of the American Paper Co., of Bogota, N.J., was held on Tuesday, July 14, at 320 Broadway, New York. The meeting was attended by the majority of the creditors, and the chairman of the committee, D. J. O'Connell, of the Box Board and Lining Co., presided. Reports were read showing the condition of the defunct concern, and in view of the probabilities of reorganization it was agreed to allow the mill to be operated under the temporary receivership, who in turn reported doing a fair business. It is very evident that from the interest taken by the creditors at this meeting, their welfare will be safely guarded, and through this committee, if there is any possible chance of protecting creditors' claims, it will be done through the able work of the chairman.

Several tremendous bolts of lightning in a storm that swept over Detroit, Mich., on the morning of July 13, started a fire that completely destroyed the Chape-Steven Paper Company's building at 12-18 East Woodbridge Street. The plant of the paper company was a roaring furnace from the basement to the roof of the sixth floor. The fire appeared to spread with amazing rapidity, as though the lightning had descended from the skies and pierced the structure from roof to cellar.

The flames were first seen on the top floor near the rear. A few minutes later they burst out from the other floors and the firemen were forced to try immediately to protect neighboring structures, and to confine the conflagration to the building occupied by the paper company.

Robert L. Chope, vice president and secretary of the company, estimated that the stock in the building was worth \$125,000, of which the loss would probably be complete. He did not know what the building was worth, but thought it would equal the same sum.

The Sterling Paper Company, of Hamilton, Ohio, has just been petitioned in bankruptcy by Jacob Hyman, Phillip Levy and Sons, and Kempner Bros., all rag dealers of Louisville, Ky. The schedule filed shows liabilities of about \$300,000 and assets consisting of land, buildings, machinery, etc., will probably aggregate the same amount. J. Howard Friend is president of the company, and it is said that this mill is one of the most complete of its kind. Later reports indicate that plans are under way for the reorganization of this company but nothing definite can as yet be ascertained.

The Federal Government's world wide exhibit of pulp and paper manufacturing compiled from statistics and samples picked up by the representatives of consular department in far corners of the globe, is to go to Watertown, N.Y. Announcement to this effect was received last week by the chamber of commerce in a letter from the Bureau of Foreign and Domestic Commerce of the Department of Commerce at Washington. The chamber made application to have Watertown included in the list of cities to be visited by the exhibit, and the Bureau of Foreign and Domestic Commerce advises that at the expiration of the present itinerary of the exhibit it will be sent here for display.

The present schedule of the exhibits' travels, as outlined by the bureau, consumes all of the time up to November 25. It is now at Holyoke, Mass., and after taking in the principal points of New England, including Boston and Portland, Me., will go to New York City, Philadelphia and work west to Chicago, Minneapolis, San Francisco and back to New Orleans.

The display is made up of manuscripts from the consular report on pulp and paper manufacture, together with stationery, supplies and samples thereof. The whole world is represented, including South America, Europe, Asia, British India and the larger islands.

Judge W. Rush Gillan of Waynesboro, Pa., has suspended the preliminary injunction in the Hollywell Paper Mill case at Chambersburg until September 10. He gives the plaintiff the right to move to have the injunction re-stated at any time that the water of the Conococheague creek shall render his live sock, by the drinking of it, sick. There is a lot of stock to be worked up at the mill, and this will be a loss if the factory cannot be operated.

A \$20,000 fire recently occurred at Skowhegan, Me., when the Riverside pulp mill of the Skowhegan Pulp Company was destroyed with most of its machinery. The fire was caused by an overheated bearing under the grinder machine, followed by an explosion. The building quickly filled with smoke and the crew was obliged to leave without shutting down the machinery. Fifteen men, working on day and night shifts, are thrown out of work indefinitely. The mill was owned by Charles Young, superintendent, and Blin W. Page, and was insured for \$14,000. Mr. Young stated Friday night that he was undecided about rebuilding.

A meeting of the creditors of Goldberg and Co., of 2026 to 2032 Pacific street, Brooklyn, N.Y., manufacturers of corrugated paper boxes, was held on July 13 last, at which an extension of time was asked for the payment of the creditors who it is believed are owed between 7,000 and 8,000. It is expected that the extension of time will be granted. The running expenses of the plant will be reduced by the renting of the one or two floors in the building occupied.

The Schmidt and Ault Paper Company, of York, Pa., announced last week that the work of remodeling and enlarging its mill at York had been completed, and operations are now being carried on at full capacity. The mill is one of the largest and most modern of its kind in its section of the state. At the annual meeting of the company held at its offices a week ago, John C. Schmidt was re-elected president; Robert A. C. Ault, treasurer and general manager, and Henry D. Schmidt, secretary.

The plant is now operating three paper machines, two of them being known as double-width Fourdrinier machines, used in the manufacture of wrapping paper. The third was the only machine in the mill when the present company took over the plant 18 years ago. The original machine has long since been rebuilt and added to by the addition of the latest appliances, but compared with the new 84-inch Fourdrinier machines it looks diminutive. It was in 1903 that the second machine was installed, and 10 years afterward the installation of the third machine was first undertaken.

In order to effect these changes, it was necessary to acquire additional property so that the incoming and outgoing material could be handled directly on the cars at the mill instead of some 600 or 800 feet away. The work of constructing a large building over existing buildings, and operating machinery while the building was being erected and the old one torn down, required the greatest care and watchfulness. Although this work has been in progress for more than a year, it was successfully carried through unmarred by any accident to life or limb of employees working in and about the mill.

In building these additions the management had in mind the danger from fire, and new floors of concrete were substituted for wood. The walls of the building are built of fireproof construction—steel frame, with brick and concrete walls, iron window sashes and slow burning mill construction wherever it was absolutely necessary to use wood. As an additional safeguard, an intensive sprinkler system has been installed. Additional facilities were added in every department, and the mill is being operated with a combined power plant of steam, electricity and water, of approximately 1,200 horsepower. The plant occupies about nine acres.

Board Company at Newington, Conn., was sold at public auction by Deputy Sheriff Chas. H. Latham, July 16 to satisfy a judgment for \$8,923.82 held by P. Garoun, Inc., Texas, and costs were added to the judgment, and the equity in the property sold to P. Gavan, Inc., for \$1.

A committee of the employees of the Windsor Locks Paper Company called on J. P. O'Brien, on July 17, who recently resigned as superintendent of the mill at Windsor Locks, Conn. After fourteen years' service, Horace Daub, chairman of the committee, gave him a handsome gold watch and spoke of the friendship those present bore him.

The United States Envelope Company has put its common stock on a 7 per cent basis, alongside the preferred.

The Anchor Mills at Windsor Locks, Conn., one of the oldest paper manufacturing concerns in the country, has closed indefinitely. The mill was built long before the civil war and held a contract with the New York Herald in 1861 when it was transformed into a woolen mill and continued as such until 1890. In that year it was again made into a paper mill. It is believed that the mill will soon be started up again, as several interested parties have been looking over the property.

According to reports, it is evident that the International Paper Company, of 30 Broad Street, New York, is doing better than 90 per cent of a normal business. While prices of newsprint are somewhat lower than they were at this time last year; there is no doubt that the margin of profit will be such as to permit of the continuance of the 2 per cent dividend on the preferred stock. Profits of between 2 and 3 per cent would seem to be a reasonable expectation for this year.

A telegraphic dispatch from Bangor, Me., states that the East Branch log drive has just arrived at the Argyle Boom with about 42,000,000 feet, and is now being rafted at the rate of a million feet a day. From the West Branch this year there are about 18,000,000 feet of saw logs, the remainder being owned by the Great Northern Paper Company and stopped at Shad Pond.

The Auburn Paper Box Co., of Lewiston, Me., made an assignment on July 16. It was definitely stated by those interested, however, that the business would not be closed down as there were orders on hand, and many more coming in.

FALLING OFF IN BOOK IN U.S.

New York, July 29.

Mill reports for the manufacture of book papers in this country during the past six months show that there was an average of about 3 per cent falling off in the normal production of this grade of paper. At least 98 per cent of the actual output of the book mills was shipped each month. The best month in this industry was March, when 98 per cent of the normal output was manufactured and 100 per cent of this output was shipped. There was a firm market value throughout the period, and the conditions of this branch of the paper industry was healthy every month. It is generally believed that the fall will bring an advance in the value of all grades of book papers.

The paper manufacturing plant of the Newington



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

London, July 20, 1914.

A scientific exposition of the uses of paper as a hygienic substitute for washable articles in daily use was given last week at the Sanitary Congress, which assembled at Blackpool, the favorite watering place in the North of England. Specimens of paper suitable for cookery purposes, along with the various qualities likely to be useful for table napkins, tablecloths, plates and towels, were exhibited and lectures were delivered by Mr. Samuel Rideal of London, who is an expert on the uses of paper for hygienic purposes. The exposition and lectures were most interesting, and Mr. Rideal pointed out that the great railway system, known as the London and North Western Railway of England, had now adopted paper towels and plates on all dining cars and on all passenger trains where there were lavatories. Mrs. Clondesley Breerton, of London, sprang a surprise on the congress when she asserted that the old-fashioned wire cover, or thin perforated wire screen, used for covering meat in sultry weather, was not of the slightest use as a protection against flies. The only way, she said, to prevent the fly laying its eggs on food was to wrap the meat in impervious paper. For hygienic use there is a growing demand for suitable paper in the United Kingdom and papermakers will eventually have to give the subject greater attention than they are doing at the present time.

The annual report of Mr. C. Hamilton Wickes, the Trade Commissioner for the Dominion of Canada and Newfoundland, has been received by the Trade Board of London. He states: "The position held by the United Kingdom is, on the whole, encouraging and I am confident that it will improve as the conditions relating to distribution in Canada become better understood by the manufacturer and of his efforts in this direction there is definite confirmation. The value of the United Kingdom manufactures imported into Canada in 1913 exceeded by 29 per cent that of the previous year, this notwithstanding the great general demands for their products enjoyed by British manufacturers during this period; while here in Canada the active competition of the United States, Germany and other countries had to be met; and it should not be forgotten also, many of our great manufacturers are from a variety of causes precluded entirely from offering their manufactures or competing on the Canadian market." Mr. Wickes points out that the Canadians rather like the production of the British manufacturers, but the difficulties of doing business, not only once, but continually, finally determines the Canadian buyer to buy as little as possible from the United Kingdom, and certainly to avoid introducing any other lines than those which they were compelled to stock. The report is a very interesting document, and it deals at some length on the advantages enjoyed by the United States in trade with Canada, particularly the rapid access to the markets and the freightage.

Fire broke out on July 10 at the premises of Messrs. F. W. Howarth, wall paper manufacturers, Blackley, Manchester, and from the outset the buildings were doomed to destruction, the damage done being esti-

mated at between \$288,000 and \$330,000. So serious was the fire that all the fire-fighters in Manchester City were required to prevent the flames from reaching adjoining buildings, amongst which was a large chemical factory. When all was over only the shell of the paper building was left, but one of the walls soon collapsed and two firemen were killed. A slight outbreak of fire, supposed to be caused by spontaneous combustion, occurred on the same night at the Muggeross paper works, near Aberdeen. The fire took place in a heap of about 15 tons of oily waste stored outside one of the main buildings. In less than ten minutes' time the paper mill fire fighters had the outbreak well in hand, and succeeded in keeping the flames from spreading in the mill. The damage done is estimated at \$240. While writing on fires, attention should be directed to the serious explosion that paper dust will cause. The Chief Inspector of Factories in England says that the last paper dust explosion at Lille, France, was caused by a naked light in a chamber where the dust was collected during the process of making paper tubes. The edges of the paper from which the tubes were made were ground down on an emery covered roller, and then the dust was exhausted by means of a fan into the chamber. In consequence of this explosion, the Inspector says he has given instructions to remedy faulty conditions in the English factories.

The members of the National Union of Paper Workers' have been giving the paper mills in the South of England considerable attention lately, and they are determined to make all mills become "trade union mills." At St. Paul Cray paper mill, in Kent, 140 workers have struck work and the men are demanding a minimum wage of \$3.50 a week, and women \$3.10 a week. The mill is owned by Mr. W. Nash, who makes a good deal of paper for the British India Office in London. Wm. Coates, the fighting organizer of the Paper Workers' Union, says that government paper must be made in accordance with the fair wage clause in the contract and he alleges that Mr. Nash has broken the contract by not paying the minimum wages. Mr. Nash, in reply, says he has always fulfilled the contracts properly and he was never against any of his workers joining a trade union; but he was determined that he would never submit to his mill being termed a "trade union mill." That is, he would not agree to placing the trade union label on every piece of paper turned out at the mill to show that trade union hands made it. While all these disputes are being discussed, the workers are out on strike pay, and the union officials are using strong language and threatening to have a government inquiry demanded into the grievances they complain of.

The letter from Mr. Alex Annandale in the Pulp and Paper Magazine of July 1st is most interesting. Of late years the British paper mill owners are manifesting a greater interest in their mill hands by establishing clubs, or helping the workers to establish them, as by this means they succeed in retaining first class workers. In the summer time outdoor sports of all sorts are entered and then at least one day and one night a mill is closed down and the workers take a trip to

the sea-side, or the country, as the case may be. This trip is sometimes provided free by the mill owners, whilst in other cases a collector is appointed and he takes a dollar or more off each employee, and with the total sum a train is chartered for the day for some resort. Usually the mill owners subsidise the dollar, or, perhaps, provides all refreshments and food for the day in a hotel. By this means a break in the year's work is greatly enjoyed and the summer evenings for those on day work are spent in healthy outdoor exercises. In the winter time there are indoor games. Some mills have several concerts, or theatricals; some have bands, and at Christmas time there is at most of the mills a gathering round the festive board to do justice to a good substantial dinner. These social functions bring the mill owners and mill workers closer together, and they tend to promote a good feeling amongst all parties. As Mr. Annandale rightly points out, "all work and no play makes Jack a dull boy," and it is gratifying to know that the majority of the British mill owners are believers in this motto.

The British paper trade has not yet recovered itself from the depression that has prevailed since December last. The following figures show the imports and exports of writing and printing paper, boards, paper hangings, cards, envelopes, bags and enumerated papers for the month of June:—

	1913. Cwts.	1913. £	1914. Cwts.	1914. £
Imports ..	1,034,636	620,826	1,002,517	593,935
Exports ..	277,039	294,041	281,472	284,619

It will be seen that while the exports in June were greater than those of June, 1913, the values are less during the same comparative periods, which, probably, may have something to do with price-cutting. The imports and exports for six months—December to June—now stand as follows:—

	1913. Cwts.	1913. £	1914. Cwts.	1914. £
Imports ..	6,198,700	3,686,633	6,026,743	3,666,783
Exports ..	1,775,621	1,888,828	1,703,953	1,752,450

The six months' exports to Canada from British mills were as follows:—Writing paper: 2,047 cwts., compared with 3,393 cwts. for same period in 1913. Printing paper: 47,390 cwts. compared with 67,492 cwts. Unenumerated classes of paper: 2,605 cwts. compared with 1,730 cwts. The States exported to the English market more writing paper within the last six months, but there was a great decline in their supply of printing paper: 14,282 cwts., as against 16,672 cwts. Of course, it is only high-class and good quality paper that is exported to Canada. Newfoundland supplies show a decline, but this is due to the fact that the shipments under way were late in arriving.

The paper trade depression, of course, has affected the imports of ground wood, along with sulphite and sulphate, etc. as the following figures show for the period December 31 to June 30 (six months):—

	1913. Tons	1913. £	1914. Tons	1914. £
Ground wood ..	4,057	18,531	2,118	10,130
Wool ..	250,714	573,558	230,368	512,969
Chemical ..	10,732	113,239	6,794	77,408
Unenumerated ..	150,082	1,982,065	150,459	1,212,117
Wool ..	8,843	32,553	7,152	25,124

A large quantity of pulp has arrived from Newfoundland and Canada since the Trade Board issued the foregoing figures. The pulp usually arrives at Man-

chester and the Anglo-Newfoundland Development Company charter the steamers of the Donaldson Line. The six months' supply of ground wood moist from Canada was: 23,523 tons, compared with 26,623 tons in 1913. It is expected, however, that when the year's supplies come to be reckoned up the Dominion will easily beat her figures of 1913. Indeed, as I write they are already above the 1913 supplies, which shows that Canadian pulp is being more appreciated on the British market. The imports of June for the month only were as follows:—

	1913. Tons.	1913. £	1914. Tons.	1914. £
Chemical pulps ...	43,972	353,770	40,788	319,559
Mechanical ..	47,750	106,881	52,623	120,302

The supply from Canada increased by about 1,000 tons in June, most of which was ground wood.

The results of the various examinations held in connection with the English Technological schools, where instructions in paper and pulp manufacture are being given, will be announced this month. From all accounts the percentage of the pupils attendance has been good and, of course, when the students finish their final courses they enter the British paper industry as practical men, because mill experience is combined with the school work. The British Paper Makers' Association offer prizes annually to the students and give the movement their support. The Manchester Technical School, where there is complete mill equipment and powerful lights for examining and testing paper in various colors is to be extended. About \$97,000 is to be spent on the extension. The value of the services which the school is able to render is becoming increasingly recognized, and if it is to keep pace with the advancing needs of the engineering, chemical and paper industry, none of its departments will be allowed to become second rate. Many of the laboratories are equipped with several thousand dollars' worth of the latest and most up-to-date machinery, engines, etc.

SULPHITE WASTE LIQUOR.

It appears, according to W. Moeller, that sulphite liquor is wholly unsuited for tanning purposes. The liquor remaining in the soda process is better adapted for the purpose. It is explained that woodpulp liquor produced as a by product in the manufacture of cellulose by the soda process has quite different properties from that from the sulphite process. The liquor from the latter process contains much lime and sulphurous acid, which must be removed before it can be used as a tanning material; all woodpulp extracts produced in Germany are of this variety. Liquors from the soda process only require to be neutralized with a weak acid before use. All cellulose extracts have about 15 per cent of ash and this is included in the total soluble matter. They also contain quantities of non-tannins such as resin, sugar, etc., which must also be reckoned as useless when the cost is calculated. All these non-tannins remain in the liquors when cellulose extract is used mixed with other materials and accumulate in the suspender liquors to such an extent that they can only be run away. Molasses, cane sugar and glucose are much cheaper to use for weighting leather than cellulose extract. Even when used as a weighting material only, scarcely 50 per cent of the total soluble matter of cellulose extract is utilized.



NEW PATENTS



WOOD-PULP THICKENER AND SAVE-ALL.

ALBERT D. WOOD, Canton, North Carolina, Inventor.
Patented July 14, 1914.

My invention relates to the manufacture of paper pulp, and has for its object the provision of a device for thickening the pulp, the device being serviceable also in the treatment of waste water, from pulp and paper mills, for the recovery of pulp fibre.

Heretofore in devices of this character, the paper pulp and water is directed into a vat having vertical partitions over which the pulp and water flows and mounted between the vertical partitions is a rotating cylinder having a surface of foraminous material, through which the water from the pulp is strained.

by pressing against the strainer surface and a portion of it flowing outwardly through the strainer surface, keeps it cleared of particles which ordinarily adhere thereto and obstruct the strainer.

My invention will be described in detail hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of my improved pulp thickener and save all showing the strainer partly broken away; Fig. 2, a side view showing the strainer partly broken away; Fig. 3, an end view; Fig. 4, a cross

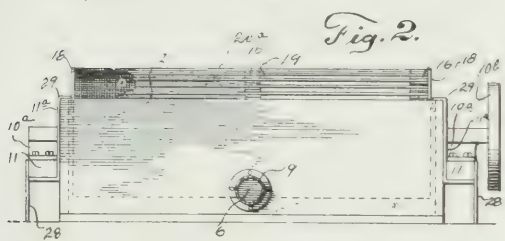
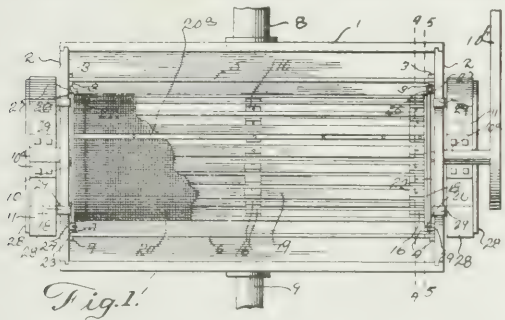


Fig. 3.

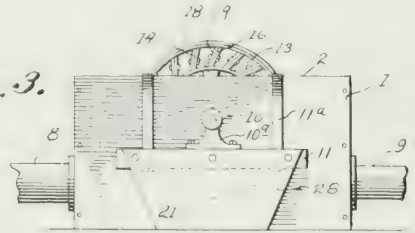


Fig. 6.

Fig. 4.

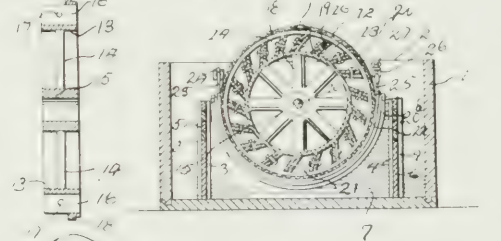
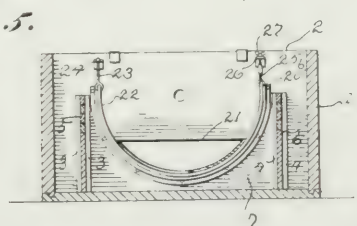


Fig. 5.



the water flowing out through the ends of the vat while the pulp passes on and flows over the other partitions and out of the vat. The disadvantage of this style of strainer has been that particles of pulp fibre, resinous matter and the like, would adhere to the surface of the strainer and eventually clog it, obstructing the passage of water through the strainer, thereby decreasing the efficiency of the strainer and making it necessary to clear the strainer by blowing it out with steam, cleaning with acids, scrubbing with brushes, or by other methods, requiring time and labor. The above treatment cleans the strainer in a very unsatisfactory manner, and is injurious to the facing or strainer surface.

In my invention the cylindrical strainer is provided with a plurality of inclined vanes forming pockets adjacent to the strainer surface that carry up some of the water that is strained from the pulp and this water

section on the plane indicated by the line 4-4 of Fig. 1; Fig. 5, a cross section on the plane indicated by the line 5-5 of Fig. 1, and Fig. 6, a cross section of one of the supporting wheels for the cylinder.

In the drawings similar reference characters will be used to designate corresponding parts throughout the several views.

1 indicates the vat having its ends 2 provided with vertical cleats 3-3 and 4-4 spaced apart in pairs adjacent to the two sides of the vat in which are removably mounted partition boards 5 and 6, said par-

tions 5 and 6 forming with the bottom of the vat a chamber 7 in which the wood pulp is strained.

8 indicates the inlet pipe connected with one side of the vat and 9 the outlet connected with the opposite side of the vat, it being understood that the water and pulp enter the vat 1 through the inlet pipe 8, flow over the partition 5 and into the chamber 7, and after being strained by the instrumentalities hereinafter described, the thickened pulp passes over the partition 6 and flows out through the outlet 9.

10 indicates a shaft journaled in journal boxes 10a mounted on beams 11 supported by means of brackets 11a engaging the upper margins of the ends 2 of the vat 1, said shaft 10 being actuated by means of a belt 10b connected with any suitable source of power or any other gearing may be substituted therefor.

A cylinder 12 is mounted upon the shaft 10 and consists of pulleys 13 keyed to said shaft and provided with the spokes 14 radiating from the hubs 15. 16 indicate vanes extending from the rims of the pulleys 13 and at an angle to the radius thereof, each of said vanes being provided with a cored opening 17. The cylinder as shown in the drawings is provided with three pulleys 13, one at each end and one intermediate of the ends, the pulley intermediate of the ends being as described above, while the pulleys forming the ends of the cylinder are each provided with a ring 18 secured to the other margins of the vanes 16 at the outer end of the cylinder.

19 indicate slats secured to the vanes 16 by means of bolts or other suitable fastenings inserted through the openings 17 heretofore described and through the openings 17 heretofore described and through suitable openings provided in said slats, said slats 19 extending throughout the length of the cylinder 12.

20 indicates a covering of wire gauze fabric mounted upon the slats 19 and having its overlapped edges secured by means of a strip of wood or other suitable material 20a, the nails or other securing means engaging said strip 20a being driven through said strip to the overlapped ends of the covering of fabric 20 and one of the slats 19 heretofore described.

In place of the wooden strip 20a, the ends of the wire gauze fabric 20 may be secured in any other suitable manner such as sewing or soldering the wire if desired and furthermore, in order to hold the fabric in place on the cylinder, several of the strips 20a may be secured around the cylinder on other slats 19 if desired, being preferably arranged at equal distances apart.

Secured to the inner side of each end 2 of the vat is a segmental flange 20b of angle iron that is spaced apart from the adjacent end of the cylinder 12 and each end of the vat is provided with a segmental opening 21 through which the water strained by the cylinder 12 flows from the vat.

To make the ends of the cylinder water tight, I provide a packing strip of 22 of any suitable packing material such as a strip of felt secured at one of its ends by means of a bolt 23 mounted on a bracket 24 while its other end is likewise secured to a bolt 25 mounted on a bracket 26 and provided a wing nut or its equivalent 27 that is adapted to be used to tighten the packing strip 22 around the surface of the cylinder.

28 indicates a board secured forward of the beams 11 and arranged opposite the openings 21 in the ends of the vat that form spouts for the water flowing from said openings.

In operation, it will be understood that the pulp and water enters the vat 1 through the inlet pipe 8 and flows over the partition 5 into the chamber 7. The

water contained in the chamber 7 flows out through the meshes of the wire covering 20 of the cylinder and the openings 21 in the ends thereof, while the pulp passes on and upward over the partition 6 and out through the outlet pipe 9. It will be understood that during the rotation of the cylinder some of the water contained within the cylinder will be caught up by the slats 19 within the pockets formed thereby and the pulp on the outside of the cylinder and carried upwardly, and as the water flows through the strainer surface, some of the pulp will be deposited thereon and will be held to the strainer surface by the pressure of the liquid in the chamber 7 until on the rising side of the cylinder it reaches the level of the liquid in the chamber 7. Then the water which has been carried up in the pockets flows outwardly through the strainer surface freeing the mass adhering thereto which drops over the partition boards, the consistency of this mass being governed by the height of the partition boards which may be raised or lowered to deliver the pulp thick or thin as desired.

It will be understood that my improved thickener and save-all is adapted to be used for straining the water from the pulp after washing during the process of manufacturing the pulp, and is also adapted to be used to save any particles of pulp that may go out with the waste water from the pulp mill. My improved thickener is also adapted to be used to remove the water after bleaching process as well as after the process of screening the pulp, before its subsequent treatment by beating and refining for conversion into paper.

It will be also understood that my improved strainer may be used for other purposes than thickening wood pulp and saving particles of pulp and further as heretofore described, such for instance as filtering the water from sewage and also using as a preliminary filter for removing leaves, sticks, etc., from water in municipal filtration plants, and I do not therefore desire to be confined in the use of my invention to the manufacture of wood pulp as heretofore described.

RECLAIMING WASTE PRODUCTS IN THE MANUFACTURE OF SULPHITE FIBRE.

Hugh K. Moore and Robert B. Wolf, Berlin, N.H.,
Inventors, patented July 14, 1914.

In the manufacture of sulphite fibre in which the ground or chipped wood is treated with acid to dissolve the lignin and cementitious materials of the wood and free the cellulose fibre, it has generally been customary, after cooking operation to "blow" the digester, or discharge the contents thereof into a blow pit equipped with a "vomit stack" so called, which permits the escape of the vapor and gases. These vapors and gases compose free sulfur dioxide, water, wood alcohol, benzaldehyde, acetone, acetic acid and various by products, all of which heretofore escaped into the atmosphere.

The object of the present invention is the reclamation of some of the waste products which have heretofore been discharged with the vapor of steam from the blow pit.

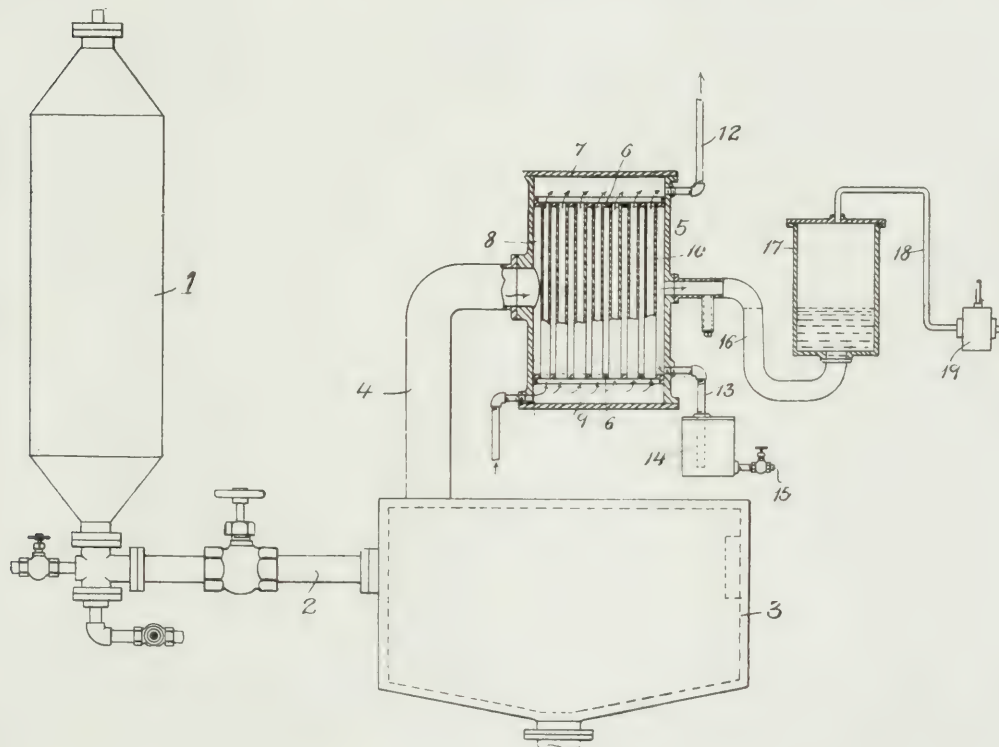
In carrying out our invention, we conduct the vapors arising from the pit into contact with a chilled solid body to condense the water vapor and those other vapors which will condense at slightly less than the boiling point of water and thereby to separate them from sulfur dioxide and such waste inert gases as may be discharged. The sulfur dioxide is then re-

covered in suitable form for reuse. The products of condensation are collected, and may be further treated for the recovery of valuable by-products therein contained. By withdrawing these products of condensation from the surface condenser at approximately the boiling point of water, the absorption thereby of sulfur dioxide is materially prevented.

On the accompanying drawing, we have illustrated certain of the instrumentalities which may be utilized in carrying out our process.

The digester is illustrated at 1 and is of the type used in the manufacture of sulphite fibre. In it are placed the chips and the acid, and, after the neck is sealed, steam is injected into the digester to bring

pit, at a steam pressure of say from 45 to 75 pounds per square inch (not including the pressure due to the static head), from 18,000 to 20,000 pounds of steam are liberated in the blow pit from the discharged water. The temperature of the contents of the digester varies from 250 deg. F. to 320 deg. F., and, as soon as the materials reach the blow pit, vapors arise therefrom and are conducted away through the vomit stack 4. Heretofore in actual practice these stacks have always opened into the atmosphere into which the rising vapors escape and become dissipated. In addition to the vapors, there has been heretofore an escape of a certain amount of free sulphur dioxide which was not utilized in the cooking operation. In accordance with



the contents thereof to the proper temperature. If desired, sulphur dioxide may be injected into the digester in accordance with the process described in our application Serial No. 451,246, filed February 1, 1910. After the wood has been cooked at the proper temperature for the proper length of time and the cellulose fibres have been freed from their cementing materials, the contents of the digester are blown in the usual way through the pipe 2 into a blow pit which is conventionally illustrated at 3, but which is constructed as ordinarily with the false bottom, not shown, for permitting the escape of the waste liquors. As usual, the interior of the blow pipe is at slightly less than atmospheric pressure. Hence when the contents of a digester of ordinary size are discharged into the blow

our process, the vomit stack is closed to the atmosphere and the vapors and gases are conducted to a surface condenser conventionally illustrated at 5. The surface condenser may be of any suitable or desired type. As illustrated, it is provided with diaphragms 6 6 forming compartments 7, 8, and 9, the compartments 7 and 9 communicating through tubes 10 passed through the chamber 8. As shown, the vomit stack discharges into the compartment 8 and the gases and vapors are caused to circulate around the tubes. Cold water or any other suitable cooling medium is introduced through a pipe 11 to the chamber 7, and, passing through the tubes to the chamber 9, is discharged through the circulating pipe 12. The vapors, entering the condenser from the vomit stack, are condensed

and pass therefrom by a pipe 13 to a receptacle 14 from which they may be drawn by the valved discharge pipe 15. Ordinarily we employ water for the cooling medium at its seasonable temperatures, although in lieu thereof a chilled cooling medium might be utilized, or the water itself might be cooled prior to its admission to the condenser.

The effect of condensation of the vapors is to reduce to liquid form the water vapor and such compounds as wood alcohol, benzaldehyde, acetone, acetic acid, and other vapors which would condense at, or slightly above the temperature of the cooling medium, the quantities, amounts and character of these compounds depend more or less upon methods, temperature, etc., used in cooking as well as the nature of materials cooked. The application of the principle of recovering these compounds by condensing vapors from blowing digesters, while herein described as applying to the sulphite process may also be applied to any other process such as the so called sulphate and soda processes.

The condensation of the water vapor to water permits the absorption by the water of only a certain relatively small portion of the free sulphur dioxide gas which escapes with the vapor. The remaining large volume of SO_2 is conducted from the condenser by means of the trapped pipe 16, through a tank or receptacle 17 which contains a body of suitable absorbent such as sodium hydrate (NaOH), calcium hydrate ($\text{CaO} \cdot \text{H}_2\text{O}$), etc. To the upper end of the receptacle is connected an exhaust pipe 18 leading to a vacuum pump indicated at 19. The unabsorbed sulphur dioxide, leaving the condenser, is drawn by the vacuum apparatus into the absorber 16 where it is wholly absorbed by the sodium hydrate or other absorbent material.

The product of the condensation, which is collected in the tank 14 may be neutralized with calcium hydroxide $\text{Ca}(\text{OH})_2$. This has the effect of precipitating the SO_2 in the form of calcium sulphite (CaSO_3) which is removed by passing the materials through a filter press, leaving the filtrate practically clear and neutral. The filtrate contains acetic acid in the form of a lime or other salt, methyl alcohol, benzaldehyde, acetone and other organic acid salts and compounds which may be separated and removed by any of the well known processes. The absorbent in the tank 17, after it has absorbed to its full capacity the sulphur dioxide gas, may be used in making the bi-sulphite which is used in the digesters in cooking the wood.

In our previous application, hereinbefore identified, we have described a process of reclaiming the sulphur dioxide and other waste products discharged from the relief valves from the digester. The present invention provides for completely reclaiming the sulphur dioxide, and heretofore has been lost in the operation of blowing the digesters into the blow pits. In addition to reclaiming the sulphur dioxide so that it may be again utilized, the present invention provides for reclaiming and utilizing valuable products such as wood alcohol, benzaldehyde, acetone, acetic acid and other organic acids and compounds. It is desirable that the products of condensation should be as free as possible of sulphur dioxide.

We have stated herein that the vapors are condensed by a surface condenser or in other words that the vapors from the blow pit are condensed by bringing them into contact with a chilled solid surface. In this only the only water which can absorb the sulphur dioxide at that which has been condensed from the

steam which comes from the blow pit, and consequently this water may be brought out so near the boiling point that it contains the minimum amount of the gas. Consequently the greater volume of unconfined gas will not be absorbed by the water, but will pass into the absorber at 17. Furthermore by the employment of a surface condenser, the water, which is used as the cooling medium and which is delivered from the condenser in a clean heated condition, may be utilized for a variety of purposes for which it could not be used if it had been previously employed in the direct condensation of the vapors by contact therewith, because in the latter case it would have absorbed a portion of the sulphur dioxide. Preferably therefore the water of condensation is maintained at a temperature but slightly less than the boiling point so as to limit the absorption thereby of the free SO_2 .

It will be understood from the foregoing description, that the instrumentalities for carrying out the process are illustrated diagrammatically on the drawing, and no attempt has been made to show them in their relative proportions or to show them in detail, as their details of construction may be varied as circumstance and convenience dictate.

NOVA SCOTIA FOREST CONDITIONS.

Ottawa, Ont. July 25th.

According to Mr. James Lawler, Secretary of the Canadian Forestry Association, who has just returned to Ottawa from a month's lecturing tour in Nova Scotia, great interest is being shown in the Dominion Forestry Convention to be held in the City of Halifax, September 1 to 4. Mr. Lawler lectured in the cities and all the principal towns from Sydney to Yarmouth and found a growing interest in this subject which so greatly concerns Nova Scotians. While Nova Scotia has large interests in mining, fishing and fruit growing, it is being found that large quantities of timber are required to operate these industries. The pit props used annually in Nova Scotia coal mines would, if placed end to end, more than stretch across the Atlantic Ocean from Sydney to Liverpool. In the same way large quantities of timber are required to make fish barrels and apple boxes, and apple barrels, so that all parts of the community are beginning to see their need of timber. This local interest along with the interest of people in Canada, outside the Maritime Provinces and in the United States, betokens a large attendance and animated discussions at the Convention in September.

PULP BURNS.

Montreal, July 26th.

A large pile of pulp belonging to the Gros Falls Company, Union Bag Company at Cap a la Madeleine, east of Three Rivers, Quebec, took fire on Monday night, July 20th, and since that time has been burning fiercely. Mr. McSweeney, of the pulp mill staff, late of the Union Bag forces in New York State, said that in all some 11,000 tons would be consumed before the fire burnt out. At the present time the site of the pulp piles is covered with tangled masses of burning wires and a few ashes. Efforts were made to quell the blaze, but it was found that despite the activities of the whole force during an entire day, during which the mill was shut down, the flames could not be subdued.

Fortunately the stock was insured and there will be practically no loss.

PAPER STANDARDS AND PAPER TESTING

C. F. CROSS, London, in "Der Papier Fabrikant."

There have been several attempts to secure the adoption in this country of the system of testing, together with the standards of paper qualities defined in terms of the tests which we owe to the K. Materialprüfung-samt.

The late Dr. P. N. Evans translated (1890-92) the original publication of professor Herzberg's "Papier-Prüfung," and we have given prominent to these tests in our 'Text Book of Papermaking' in successive editions.

There has resulted a recognition of the value of this contribution to the technology of paper, but there is no general adoption of such standards as those formulated in this work.

We have been asked from time to time whether we could inform the technical public in England as to the moral effect of these standards on the industry in Germany; but we are quite unable to do this; many of our colleagues in Germany would no doubt be able to answer this question.

It has always appeared to us that on this question of moral effect, we had to reckon with the fact that these standards are rather standards for the buyer and consumer than the papermaker.

In this country there is always an objection to science, *qua* science, as applied to industry; a sort of prejudice which it is difficult to account for, and which flourishes in spite of the moral influence of our technical schools and teaching centres.

When we come to measure this prejudice, we find that it takes its strongest stand on the position that commercial valuation is impossible in terms of any physical or mechanical tests. In the case of paper it is an interesting question as to how far such methods can be justified to the practical man.

The most satisfactory short expression of results of such tests is a mathematical formula; just as in all matters of philosophy it is always more satisfactory to arrive at a poetical formula rather than a prose expression. The former, in addition to its value as a short expression, seems to carry with it some extra warrant of discovery.

While the value of such formulae is we admit, over-estimated by many, it remains nevertheless an interesting problem for paper technologists to arrive at mathematical expressions; or, to go back to our first position, to arrive at an expression of paper values in the sense of their actual commercial or, *slang* values.

Our friend collaborator, Mr. J. F. Briggs, has given special attention to this matter, and in his present position as one of the technical directors of a paper mill of the highest standing and reputation, he is able to apply the science of the subject in the solution of routine technical and commercial problems.

Mr. Briggs has allowed us to read a communication in convention number 1914 from himself, on the subject of "Handle" of papers, and his conclusions fully confirm our view that there is no full measure of paper values in terms of breaking strain or breaking length, but that there is a second fundamental factor to be reckoned with, closely connected with bulk in the physical sense of specific volume. The judgement of

the expert paper buyer is a complex integration of conclusions from observations in these two main directions.

Mr. Briggs's long continued observations and experience lead him to an empirical formula in which he adds the factor derived from bulk, to the factor of value expressed in breaking strain (or breaking length) and he justifies his formula by illustrative examples drawn from actual mill experience.

It is satisfactory to see that this factor, for recognition of which we have long contended, is admitted; but we think it remains to find mathematical expressions nearer the actualities which may furnish clear mental pictures of the papermaker for the control of his paper-making operations.

We have on many previous occasions endeavored to show that the ingenious and otherwise useful expression "Breaking length" is often misleading and generally of no direct use to the papermaker in the technical control of his operations.

The physical actualities primarily involved in physical tests of paper are:

- 1) In Breaking strain: the sectional area.
- 2) in specific volume-weight, the specific density or concentration of fibre substance.

It is of practical importance to the paper-maker to keep in view the ratio of thickness of sheet to fibre density and we doubt whether the practical man could, without the help of simple mathematics, at once state the effect, say upon weight per square metre, of reducing each of these factors by 25 per cent.

Whereas if

$$W = c \cdot t \cdot s \text{ and } w = \frac{3}{4} \cdot \frac{3}{4} \cdot \frac{9}{16} \cdot \frac{1}{t \cdot s}$$

the reduction is nearly 50 per cent. In the expression for Breaking Length

$$L = \frac{W}{h \cdot t \cdot s} \quad \text{breaking strain for strip of width } h,$$

it appears that if t and s be made to vary inversely the value L , which is a calculated value, remains unaffected. But in reference to the physical actualities how would the practical man proceed to make papers of constant Breaking Length under the condition of so varying s and t , that the product remains constant.

These are only taken as casual examples.

It appears to us that the papermaker has to concentrate on 1 and 2 as above; in regard to 1 he requires to bring his tests to unit of sectional area, and to maximum fibre density, that is, calculate his numbers on the assumption that the area broken consists entirely of fibre elements without air space.

In regard to 2: the second aspect of "efficiency and economy" in converting fibrous raw materials into paper is bulk, in the limited sense of volume.

It appears that these two variables must be treated jointly, and therefore when it comes to numbers, as a product. The final expression of efficiency and economy from the papermakers' point of view will be some function of this product which remains to be ascertained.

We do not pretend to follow these matters closely enough to offer more than the general suggestion:

but we have noted with interest the experience of a technologist, who like Mr. Briggs has to take these matters from a very different point of view from that which underlies any ordinary scheme of official tests.

It would be a matter of interest to compare his experience and conclusions with those of technologists working in others of the many sectional departments of papermaking.

NORTH EUROPEAN WOOD PRODUCTS.

The wisdom of Sweden and Finland are compared in a recent report in regard to the use of the waste of the respective local wood-working industries, much to the advantage of the former. It is shown that Sweden, for example, in 1911 produced from sawmill residue charcoal, Dutch black, resin, tar, wood-oil, wood spirit, turpentine, etc., to the value of nearly 20,500,000 marks, whilst 6,876 workpeople were engaged in burning coal, 100 in distilling wood, and 28 in making Dutch black. The value attributed to the foregoing refers only to what was produced in factories. In the year named the production of smithy coal as a home industry valued 30,000,000 marks. A large proportion of this coal is used in Sweden itself to take the place of the dear pit coal, the importation of which is falling off. In the opinion of competent people wood distillation deserves more attention at the hands of Finnish industrialists. With the aid of experienced chemists the industry should yield satisfactory profits, and the raw material is abundant, considering the number of stumps, branches, sawdust, etc., thrown away. In the cellulose factories the waste alkali is now run out as something of no value, whereas a fine spirit might be made from it. Every year in Finland millions of marks value in cellulose lye are run away, and thus a source of revenue is lost all through the industry's negligence in not keeping abreast of technical industrial progress. *The Financier.*

CHARLES SUMNER, DECEASED.

The machine industry loses an old and esteemed member in Charles Sumner Barton, President and Treasurer of the Rice Barton and Foles Machine and Iron Company, who died at Worcester, Mass., on July 11th.

The large rag house of Samuel Kovinsky, of Chatham, Ont., was destroyed by fire recently. It is supposed that the blaze broke out owing to spontaneous combustion. The building, which was about 250 feet long by 30 wide, was filled at the time, and the loss is a heavy one.

In connection with the recent amalgamation of the Metropolitan Bank and the Bank of Nova Scotia it is interesting to note that S. J. Moore, is President of F. N. Burt Co., Limited, and the Pacific Burt Co., Toronto, manufacturers of sales books, paper boxes, etc., while Mr. Firstbrook is a member of the firm of Firstbrook, Bros., box manufacturers, Toronto.

J. H. Brown, who runs a large plant at Marseilles, Ill., for waterproofing paper, was in London and other Ontario cities last week. He has patented a new water-proof paper rain coat, which will retail at about a dollar, can be worn ten or twelve times before being discarded. Mr. Brown expects that there will be a big demand for the garment. He has also put several other novelties on the market in the way of waterproof paper specialties.

PAPER TRADE PRODUCTS OF THE BRITISH EMPIRE.

The special supplement of the Chamber of Commerce Journal, England states: The question of developing the manufacture of paper pulp from bamboos in India has been discussed in the Indian Forest Records by officials concerned in the utilization of the forest products of India, and a report designed to afford data for action on the part of capitalists has been issued. Information is provided as to a number of localities where large tracts of bamboos are available, the various species of bamboos found there, special advantages for the manufacture of pulp existing in each locality, suitable sites for factories, cost of transport, labour, etc. Five places in Lower Burma and six places on the west coast of Southern India have been selected as especially favorable. Success in the enterprise would seem to depend largely on satisfactory and cheap transport. Two notable factories have been established in the East for the pulping of bamboos, one in Formosa, and the other near Haiphong in Indo-China. The Chairman of the Industries Committee of the Pretoria (Transvaal) Civic Association states that bales of ordinary veldt grass were sent to Scotland and America for experimental purposes, and reports from Scotland indicate that this grass is nearly equal to esparto for paper-making purposes. It is stated that a capital of £20,000 would be sufficient to run a mill capable of producing a minimum of 15 tons of packing and coarser kinds of paper per week. In advocating the starting of a paper factory at Pretoria, the Chairman points out that in addition to the grass, two of the principal articles necessary for the manufacture of paper, viz., lime and coal, are available in large quantities at a cheap rate.

A LONG CONTRACT FOR MECHANICAL WOOD PULP.

It is stated that Aktieselskabet Labros Trasliberi, the well-known Norwegian manufacturers of mechanical wood pulp, has sold its entire production to an English firm of paper-makers over a period of twenty-two years. Though the price has been based upon the present cost of manufacture, it appears that the Labro Company have the option of increasing or lowering the figure in accordance with the necessities of the market, but it is understood that the contract will be of the total value of between krs. 12,000,000 and krs. 15,000,000. The mill is now in course of enlargement, and when the extensions are completed will have a capacity of between 18,000 and 20,000 tons of wet pulp per annum.

PACKING PAPER OF INCREASED STRENGTH.

Although the highly developed paper industry is today in a position to make sufficiently strong packing papers for all purposes it is nevertheless frequently found that several layers of an insufficiently strong packing paper are employed for packing. This is an unnecessary additional expense which can be avoided by employing papers having an insertion of long fibres.

Such papers are made by cutting flax, hemp or even wool into suitably long parts and applying these fibres

to the web of paper which is being formed. Rotating brush-rollers will be used which remove the fibres from a storage receptacle and distribute the same across the paper-web. Generally there will be a second brush arranged behind the first one and having a higher speed for removing the fibres from the same. Sometimes two or more such additional rollers will be arranged. When several devices for applying the fibres are necessary the same are preferably arranged one over another, but when the wire is sufficiently long they may be arranged one behind another. If the fibres are to be embodied in the web principally in the longitudinal direction of the machine, the device for applying them will be arranged transversely of the wire, whilst if the fibres are to be located at right angles to the direction in which the paper runs the devices for applying them will be arranged at the two sides of the wire. Also, both arrangements may be used simultaneously. If a great many fibres are to be applied, instead of the brush-rollers roller having ribs or rotating ribbed discs will be used. In order to prevent the fibres flying out laterally and consequent loss, arresters will be arranged at the two sides of the wire at which the fibres slide down and are conveyed back by endless bands into the storage receptacle.

Papers having longitudinal threads are made by yarn being unwound from bobbins and pressed by means of press-rolls into the single or double paper-web. Threads running transversely are drawn crosswise over the paper-web by means of specially constructed swinging arms and are incorporated in the same.

HEAT REQUIREMENTS IN THE SULPHITE PROCESS.

In the sulphite process heat is used for mechanical and chemical processes. The quantity of power re-

quired for producing 100 kg. sulphite cellulose fluctuates of course according to the apparatus employed. There are plants in which the water supply requires 15 to 20 per cent of the entire consumption of power, whilst other plants use only little power for this purpose, because the water does not have to be lifted very high.

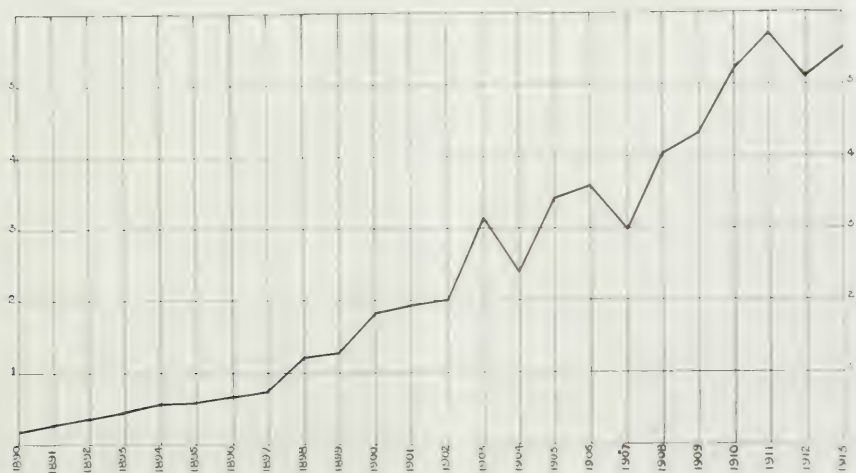
1) Power required: On an average for 100 kg. unbleached sulphite cellulose 40 h.p. hours are required, for which 220 kg. steam equal to about 160,000 calories are necessary. A good steam engine using 4.2 kg. steam at 12 atmos. at ≈ 300 deg. C. is assumed in this case. 10 per cent is reckoned as the loss for the effective horse-power and an additional 15 per cent for transmission.

(2) Cooking: For this 320 kg. steam = about 210,000 calories at 7atmos. pressure are used.

(3) Drying: For this 190 kg. steam = about 120,000 calories of 3 atmos. pressure are used. It is assumed that the cellulose arrives 35 per cent dry and at 15 deg. C. on the drying cylinder and is absolutely dry at 87 per cent.

For cooking and drying about 500 kg. steam, corresponding to about 330,000 calories are thus required per 100 kg. cellulose. This corresponds to a total consumption of 110 to 120 kg. coal per 100 kg. unbleached with 6½ fold evaporation. When making 2,500 kg. cellulose per hour the total consumption of steam is about 18,000 kg. steam when direct steam is employed. When steam is taken from a turbine about 2,000 kg. steam per hour less will be used when making the same quantity of cellulose. These figures hold good for a turbine of 21.4 kg. steam consumption per kw. 17½ atmos. 300 deg. C. steam removed at 6½ atmos. For large plants the consumption of steam increases correspondingly, of course, but the expenditure of power increases only slightly. Der Papierfabrikant

Canadian Pulp and Paper Trade



Exports of Canadian Wood Pulp in Millions of Dollars, 1890-1913.

PULP AND PAPER NEWS

The town of Hearst, which is located 134 miles west of Cochrane and had a population of three or four hundred persons, was destroyed by forest fires a few days ago. The residents fought the flames for three days, but finally had to give in. All the buildings were wiped out except four. The frequency of bush fires in the northern part of the province has called attention for better protective measures in the timber limits, and it is probable that some action will be taken by the Ontario Government.

George Pauline, who for the last twenty-five years has been a caller to the Canadian trade, twice a year, representing Robert Fletcher and Son, paper makers, Manchester, England, has resigned. He expects to visit Canada in September next when he will represent special lines turned out by several old country mills.

N. E. Wainwright, who for some time has represented the National Paper Co., Limited, 156 John Street, Toronto, has resigned, and joined the selling staff of Ritchie and Ramsay, Toronto. He has been succeeded by E. G. R. Clarke, late of Montreal, where he was on the advertising staff of the MacLean Publishing Co. Mr. Clarke has entered upon his new duties.

O. W. Porritt, of Porritt and Spencer, Limited, paper makers, felts and jackets, England, was in Toronto and Montreal last week, calling upon the trade.

John Regnier, of Boston, representing the casein sales department of J. A. and W. Bird and Co., was in Toronto and other cities recently calling upon the paper trade.

Thomas Gain, the veteran paper man, who has been thirty-six years in the business and recently recovered from an attack of pneumonia, has returned to Toronto and resumed his duties as sales manager of the Don Valley Paper Co., after spending a few weeks in the Catskill Mountains, regaining his health.

George E. Charles of Toronto, representing the Rior don Pulp and Paper Co., Montreal, has returned from an extended trip to the Middle and Western States. He reports that the demand for sulphite pulp is keeping up well, and that there is some improvement in the trade.

It is reported the George Irish Paper Co., of Buffalo, intend entering the Canadian field, and that they will establish warehouses in Toronto, Ottawa, Montreal, Hamilton, London and Winnipeg and carry stock at all these centres. Lou Haupt, President of the Company, was recently in several cities in Ontario on a business trip.

The Arnprior Felt Co., Limited, of Arnprior, Ont., has been granted a charter. The capital stock of the company is \$40,000 and the incorporators of the concern are James T. Griffith, Murtagh Sullivan, John Cunningham, George H. Miles, S. R. Rudd, N. E. McNaughton and Wallace A. Mackay, all of Arnprior. The company is empowered to construct, build and

operate felt and pulp mills, and to engage in the manufacture and sale of pulp-paper, felt and woolen goods or any product in which these materials are used.

Publishing and Printing Co. of Canada, Limited, has been granted a charter. The head offices of the company are in Montreal, and the capital stock is \$300,000. The concern is empowered to carry on business generally as printers, publishers, and engravers, as well as paper makers, envelope, paper bag and box makers. Among the incorporators are Leon Charlebois, E. T. Sayers, Felix Barriere, A. E. Balfry, and H. L. Moreau, all of Montreal.

An interesting suit has just been started at Os- goode Hall, Toronto, in which action is taken on be- half of Mrs. Isabella Taylor, widow of the late William T. Taylor, who seeks to upset the title of Robert Dav- ies, President of the Don Valley Paper Co., Limited, Toronto, to the old Taylor brick works and paper mill property of 144 acres in the Don Valley. The claim is made on the ground that the land was ac- quired in 1901 at an unfair valuation, when E. R. C. Clarkson released it from an agreement made by Tay- lor Bros. for the benefit of their creditors. Davies gave \$332,000 for the Canadian Northern Railway right-of-way through the property, illustrating the marvellous increase in values in that locality just east of Toronto. In 1894 Taylor Bros. who owned the brick works and paper mill, mortgaged the property to Robert Davies, to secure \$75,363 and interest. It is stated that during the assignment proceedings, Mr. Davies valued the property in his proof claim at \$35,000. The creditors appointed Mr. Davies inspector of the estate, and he is said to have received from the as- signee a deed of release of the land for a nominal con- sideration over the valuation of \$35,000. It is the striking difference between the \$35,000 for the 144 in 1901 and the \$332,000 for a narrow strip in 1911 that causes the suit. The appellants claim the right to redeem the land, and express doubt whether they or their creditors received fair play in the sale and distribution of their estate and effects.

Frankel Bros., proprietors of the Toronto Mill Stock and Metal Co., dealers in rags and waste paper, are erecting a large warehouse in Toronto on Broadview Avenue, Toronto, which, it is understood, will be leased for a term of years from large wholesale house.

The new classification recently made by the Ameri- can Felt Makers Association, which has gone into effect is causing some little trouble to Canadian dealers in rags and waste paper who have been exporting to United States mills. This is, however, being over- come as the provisions of the new classification are being understood.

Collet Sproule Limited, paper box manufacturers, 786 King Street West, Toronto, are removing their plant into their new and well-equipped factory on Portland Street, Toronto. The structure is a hand- some one block of concrete and brick consisting of four

storeys and basement. In dimensions the building is 50 by 100 feet, with white brick trimmings and an imposing front, and will more than double the present output of the company. It is understood that the factory cost in the neighborhood of fifty thousand dollars. It is splendidly lighted and provided with all modern conveniences in the way of elevators, shipping facilities and manufacturing conveniences.

C. F. Beyerl, who recently resigned as secretary of the Hammmill Paper Co., of Erie, Pa., and afterwards paid a visit to Montreal, Toronto, and other Canadian cities looking over the prospects of establishing a mill in Canada for the manufacture of writing paper, is at the head of a group which has organized a new company at Hamilton, Ohio, known as the Hamilton Paper Mills Co., which will take over the mill operated by the Sterling Paper Co., which make high grade light weight specialties including onion skin, catalogue and water leaf papers.

The largest waste paper warehouse in Canada has just been erected by E. Pullan on Mand Street, Toronto, near Adelaide Street. It consists of five storeys and basement, and is of brick, being of mill construction. Mr. Pullan moved into his new quarters this week. The building is 100 feet deep by 60 wide, and cost \$45,000. His former premises will be used for storing rags and the old rag house will be converted into a place for sterilizing and washing wiping rags, a complete outfit being put in. An automatic sprinkler system has been installed throughout the building, which has hard wood floors, metal sash, wired glass windows, and is well lighted.

Construction work on the new publishing house of the Methodist Book and Publishing House at the corner of Queen Street West and John Street, Toronto, is progressing rapidly. All the steel work has been completed and the walls are now being built. The premises, when completed, will be the largest possessed by any publishing concern in Canada. The handsome new business house of Hugh C. MacLean, Limited, publishers of trade papers, Toronto, which is located on Adelaide Street West, near Spadina Avenue, Toronto, is about finished, and will soon be ready for occupancy. The structure is five stories high with basement.

Charles C. Norris, President of Norris-Patterson, Limited, Advertising Agency, died on July 22, in Toronto. He had been ill in health for the past three years. He was one of the early publicity men in Canada, being first connected with Toronto Saturday Night, later with the Toronto Globe, and then for eighteen years advertising manager of the Mail and Empire, from which he resigned to enter the agency business. He leaves a widow, one daughter and two sons.

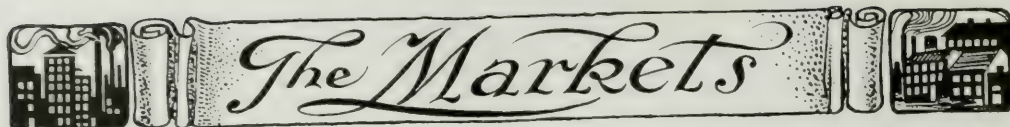
A few days ago the Ontario Department of Lands, Forest and Mines awarded the right to cut red and white pine on three timber reserves in the Metagami district of the province. Last week tenders were awarded for cutting the red and white pine in the township of Blyth, which lies northwest of North Bay. The highest tender in each case was accepted, and where there was a tie, the berth was subdivided. The successful bidders were:—Berth No. 1, 12½ square miles, went to John R. Booth, Ottawa, the bonus being \$10.50 per 1,000 feet board measure, in addition to Crown

dues of \$2.00 per 1,000 feet and ground rent of \$10.00 a square mile. Berth No. 2, 12 square miles, went to J. R. Booth and George Gordon, who tied, the bonus being \$8 per 1,000 feet, with Crown dues and ground rent the same as before mentioned. As regards the third berth, J. B. Smith and Sons, Toronto, were successful, the bonus being \$10.26 per 1,000 feet, and Crown dues and ground rent as in the other cases.

The Bank of Commerce, Toronto, is the only Canadian bank which has a separate archives building. It is located on Atlantic Avenue, Toronto, and is a massive, four-storey brick structure. The system adopted by the Bank of Commerce is similar to that of the British and Canadian governments where all records that can be collected are gathered together in a central office and are arranged and indexed. In the building of the Bank of Commerce a special plant has been installed for the destruction of books and papers condemned to death. A William's shredder has been put up in the basement, which is driven by a forty-horse power motor, and the knives of the machine tear all the documents, which are fed into it, in shreds. The paper is drawn into a separate chamber and conveyed by a pipe to another section of the building, where it is baled in a press operated by electricity, and sold to paper manufacturers. The output has been contracted for for some time by the Provincial Paper Mills Co., Limited, and is used in the various plants of that company. Under the old system of destroying documents, paper manufacturers did that work under the supervision of bank officials.

It is understood that Duncan Chisholm representing the Chisholm Corporations, Limited, will erect a pulp and paper mill at Smooth Rock Falls on the Metagami River and that several engineers have been on the ground for some time examining the site and taking preliminary measurements under instructions of Louis Grey who was formerly connected with the Imperial Pulp and Paper Mills at Sturgeon Falls, Ont. The ground wood mill, which will be erected first, will have an output of seventy five tons per day, and the paper mill about 150 tons of news print. Some three hundred hands will be employed, and the total outlay on the new projects will be close onto two million dollars. Some time ago Mr. Chisholm entered into an agreement with the Ontario government for the purchase of the pulp wood on the Metagami river pulp limit. He will pay the Crown dues of forty cents per cord for spruce and twenty cents per cord for other woods. The Crown has reserved a railway right-of-way, water powers, and granted lands.

J. L. Englehart, Chairman of the Timiskaming and Northern Ontario Railway Commission, has returned to Toronto from his monthly inspection of the line. He reports that the recent devastating fires in the north have all been extinguished and that the agricultural prosperity of the settlers is very promising. Not as much pulp wood is being taken out this season owing to the fact that the residents are devoting their attention more to seeding and harvesting operations. He said it was a fair deduction that the fires, which do exist below the line of the Transcontinental Railway, are due to the clearings of settlers who are taking advantage of the dry state prevailing to make extensive clearings by fire. This will allow a larger acreage to lie under the plough during the season of 1915.



The Markets

CANADIAN MARKETS.

The market for news print continues fair, although there has been a reported slackening of demand in the last couple of weeks, owing to the newspapers printing smaller editions during the summer as advertising patronage is generally at its lowest ebb in the months of July and August. Prices hold fairly firm. The book and writing mills are a little busier and report that several establishments are getting out catalogues which require supplies, while a number of concerns have held their annual meetings the printing of whose reports and statements always creates more inquiries for book and coated papers. Manila and fibres have been in rather poor demand, and jobbers are not as busy this month as they were during June. Stocks are, however, pretty low and many do not care to load up at the present time until they size up the outlook for fall trade. Roofing and building papers are not in very active requisition. Paper towels, napkins, toilet and tissue papers are enjoying good inquiry, owing to the holiday season and are commanding fair prices. The demand for ground wood pulp is quiet and few, if any, new contracts are being made at this season of the year. The sulphite situation keeps up well, and prices remain fairly firm. In the tag and paper stock line there is some activity in roofing material, but in mixed papers, thirds and blues, over-issues and other lines, there is a falling off in price. Some paper box factories report that business has livened up during the past few weeks, owing to the approach of the fruit canning period. On the whole the pulp and paper industry, regarded from every standpoint, is keeping up as well as could be expected, in view of the slack condition of affairs. It has not suffered to the same extent owing to the depression as many other lines of industrial and mercantile effort. The following prices prevail f.o.b. Toronto.

Paper.

News (rolls), \$1.90 to \$2 at mill, in earload lots.
 News (sheet), \$2.00 to \$2.10 at mill in earload lots.
 News (sheet), \$2.20 to \$2.75, depending on quantity.
 Book papers (earload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (earload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (earload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila B, \$2.50 to \$3.00.
 Manila No. 2, \$2.75 to \$3.25.
 Manila No. 1, \$3.25 to \$4.00.
 Pigeon Kraft, \$3.75 to \$4.50.
 Gaudet Kraft, \$4.00 to \$4.75.

Pulp.

Ground wood, at mill, \$15 to \$16.
 Ground wood, \$20 to \$21 delivered.

Sulphite (unbleached), \$40 to \$42, delivered in Canada.
 Sulphite (unbleached), \$42 to \$43, delivered in United States.

Sulphite (bleached), \$55 to \$56, delivered in Canada.
 Sulphite (bleached), \$56 to \$57, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.80 to \$1.85, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 45c.
 White blanks, 80c to 82½c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c.
 No. 1 Manila envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 35c.
 Over issues, 45c.
 No. 1 clean mixed paper, 25c to 27½c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.20 to \$1.25.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinetts, 75c to 77½c.
 Flock, 85c to 87½c.
 Tailor Rags, 65c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5½c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., ear lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, ear lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, ear lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, ear lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, ear lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, ear lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila B, \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.

News quality, \$41 to \$42 per ton.

Bleached sulphite, \$54 to \$59 per ton.

Kraft pulp, \$3.60 to \$4.00.

Ground wood, No. 1, \$15 to \$16.

Ground wood, No. 2, \$22 to \$24, delivered United States.

UNITED STATES MARKETS.

New York, July 23rd, 1914.

There has been a fairly active demand for mechanically ground wood pulp during the interval, with considerable strengthening in price due to the low water season and also to the loss of a large pile of finished pulp by a recent fire. Practically the whole of the burned stock had been contracted for and was rapidly diminishing under a fair demand for shipments. The value of ground wood is now in the neighborhood of \$20 to \$24 a ton delivered, for fresh pulp and about \$17.50 to \$20 for No. 2 pulp. Numerous inquiries for small lots have been received in the local market.

Importers report a little firmer feeling in the chemical fibre markets during the interval. Stocks having been gradually reduced in storage quarters by a fairly steady movement of spot lots on request. The accumulation of pulp on this side resulted from misfortunes to certain paper manufacturers for whom good sized consignments of sulphite were en route. The inability of these buyers to accept the goods caused them to be put in storage at great expense to the importers. The open navigation season saw the arrival of large cargoes of sulphate and kraft pulp on steamers, which had been locked in foreign harbors during the winter.

These cargoes were promptly shipped to consumers having contracts and who had low stocks. Certain mills, which had been making offers for spot kraft were promptly satisfied at prevailing figures.

Movement in rags both foreign and domestic, has been chiefly confined to shipments on outstanding contracts and a few spot lots. Prices in old grades are weak. The past two weeks has reflected a fair demand for foreign new cuttings at 6c to 6½c a pound.

Fairly heavy importations of old rags for the manufacture of medium and low grade papers have been made during the month. Probably none of the paper stock markets has been so weak as the bagging market. Considerable difficulty has been experienced by importers and dealers on account of moisture. Complaints by mill men are numerous. Rejections have been more or less heavy. There have been rather wide differences of opinion between the dealers and mill men. Some of these have only been settled by the most acute arbitration. One case was arbitrated for a sum of \$20 on an order aggregating more than \$3,000.

In old waste papers there has been a poor demand, and low prices on all grades except book stock have dominated. All grades of flat stock have moved with a fair amount of activity and prices have quite firmly held up. The poor demand for box boards and the weakening in values has led to considerable weakness of the lower grades. Very low prices and large accumulations in packing quarters are the leading characteristics.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.

Ground Wood, No. 2, \$17.50 to \$20, delivered.

Unbleached Sulphite, dom., 1.90c to 2.00c delivered.

Unbleached Sulphite, impt., 1.82½ to 1.95c, ex dock, New York.

Bleached Sulphite, domestic, 2.75c to 2.90c, delivered.

Bleached Sulphite, impt., 2.55c to 2.65c, ex dock, New York.

Easy Bleaching, imptd., 2.05c to 2.15c, ex. dock, New York.

Unbleached sulphate, imptd., 1.75c to 1.85c ex. dock New York.

Bleached sulphate, imptd., 2.50c to 2.75c, ex. dock, New York.

Kraft Pulp, 1.70c to 1.85c, ex. dock, New York.

Paper.

There has been some improvement in the tone of the paper market in general. Millmen and jobbers talk more optimistically and report a fairly healthy tone to the situation here. Mills have been running on pretty good time for this season of the year. Fairly good-sized orders have kept the mills pretty busy, while the numerous small orders which create the feeling of a lot of business, have been rather sparse. Jobbers have allowed their stocks to deteriorate in the case of small lots, for those have been rather few in number. Newspapers have taken their normal consumption of paper. Transient orders have been fairly good at prevailing values. The demand for wrapping papers has been quiet, and prices rather weak. Keen competition among mills in this grade has been a leading characteristic. The contracts for fall delivery to publishers for book papers are being made, and the price is improving in this grade. Mills have been fairly busy bidders are in fair demand, especially in the medium grades. Kraft papers are in fair demand under demoralized conditions of price. Box boards of all kinds are in poor demand. There has been some improvement in the demand for paper bags. The tissue market reflected a quiet tone in the interval, but it is rumored in the trade that there will be some sharp advances in prices, which is anticipated in the next few weeks.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.

News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.

News, side runs, 1.95c to 2.05c.

News, sheet, \$2.20 to \$2.30 f.o.b. New York.

Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.

Writing paper, superfine, 13½c to 17c, del. east of Miss. River.

Writing paper, extra fine, 11c del. east of the Miss. River.

Writing paper, No. 1, fine, 9c, del. east of the Miss. River.

Writing paper, No. 2, fine, 8c del. east of the Miss. River.

Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.

Bond paper, 5c to 24c, delivered east of Mississippi River.

Ledger paper, 8c to 30c, delivered east of Mississippi River.

Linen paper, 7c to 18c, delivered east of Mississippi River.

Manila jute, 4½c to 5c, delivered.

Manila, wood, \$2.40 to \$3.00, delivered.

Kraft, No. 1, \$3.50 to \$3.75 f.o.b. New York.

Kraft, No. 2, \$3.00 to \$3.35 f.o.b. New York.

Boxboards, news, \$28 to \$30 per ton, delivered.

Boxboards, straw, \$26 per ton, delivered.
 Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 40c to 42½¢ f.o.b. New York.
 Tissue, tan-drummer, 17½¢ to 50¢ f.o.b. New York.
 Tissue, jute-Manila, 40c to 41½¢ f.o.b. New York.

THE BRITISH MARKETS.

Special to Pulp and Paper Magazine.

London, July 20, 1914.

The British paper industry is in a moribund condition, and were it not for a fair demand on domestic account, many of the mills would be in a helpless state. The depression in trade is general, but the paper trade is now suffering from its dullness since September of last year, and naturally, large stocks of paper are on hand. The six months' trade since the first of January last shows a decrease 71,668 tons of paper, boards, writing and printing paper, envelopes, etc., when compared with the same period in 1913. All the British colonies are taking smaller supplies, and this is a serious matter because they are the best markets for the mills of the United Kingdom. At some of the mills the help has been cut down to a minimum. Economy is the dominating feature of all manufacturers, and competition and price-cutting are keen in the home markets. In the London and provincial printing and publishing houses a fair amount of news-print and writing and printing papers of a good quality are finding a consuming channel. Packing and wrapping papers have also improved in demand, but all other classes of papers and boards are changing hands very slowly. Nearly all the manufacturers are complaining of the bad state of business, and so are the paper agents and merchants. In Germany and Scandinavia the same story is to be heard everywhere one goes.

Ground Wood.

Moist ground wood is changing hands in some instances at a fraction over the cost of production, and naturally the English wood pulp importers are alarmed. Fortunately, business transactions of this character are confined to a small and very limited circle of sellers. Enquiries are being made for next year's contracts and for contracts further ahead. Business to-day is confined to small spot parcels, but buyers are holding aloof until sellers come down a further notch before they close future terms. In Norway and Sweden business is very dull. Large supplies are arriving in England from Newfoundland and Canada.

Prices are now about as follows, c.i.f. British ports: Pine, 50 per cent, unwrapped (prompt), \$9.48 to \$9.60.

Pine, dry (prompt), \$19.20 to \$22.

For forward delivery charge about half a dollar extra.

Chemical Wood Pulp.

There is light revival in the demand for sulphite, but buyers are mostly interesting themselves in contracts for 1915 and longer. Owing to the depressed condition of the paper industry buyers are very careful, and will not practically buy little in prompt or spot parcels. Soda pulps are on a lower basis as regards prices and the stocks on producers' hands appear to be plentiful. Kraft pulp shows little change. Looking at the position generally, buyers are hoping for further concessions. In Scandinavia new business is scarce and attention is riveted on deliveries against current

contracts. Prices are about as follows, c.i.f. British ports:—

Bleached Sulphite (No. 1), \$55.80 to \$60.
 Easy bleaching sulphite, \$40.20 to \$41.40.
 Sulphite news, \$36.00 to \$37.80.
 Unbleached soda, \$36.50 to \$36.00.
 Soda kraft, \$31.80 to \$33.60.

Rags and Chemicals.

Stocks of rags are heavy, indeed, dealers report that they are heavier than usual on account of the slackness at the mills. Prices, however, are unchanged, although some of the low grades may be had on a lower basis. The chemical trade, in common with other industries, is feeling the depression of business, but values are practically unchanged. Caustic soda is \$48 for 76 per cent and 60 cents extra for 77 per cent. Salt cake is \$9.90 per ton; soda crystals are up to \$10.20 per ton; sulphur \$24 per ton; Alum \$28.80 to \$29 per ton for lump and \$33.60 for the ground. Bleaching powder is \$26.40 and upwards for softwood. Ammonia alkali, which is in good demand is \$10.20 to \$10.40 for 58 per cent. Esparto is still scarce and dear.

Fillings.

Contracts for China clay are being completed, and prices are about the same as this year's. Gypsum, mineral white, pearl hardening and other fillings and loadings are quiet and unchanged in values.

EXPORTS TO AUSTRALIA LESS.

The report of the Canadian Trade Commissioner to Australia (Mr. D. N. Ross) for the year 1913, shows an active falling-off in the exports of Canadian paper to the sister colony. The figures for 1913 are as follows:—Printing paper £149,050; paper hangings, £1,421; all other, £4,298; stationery, £905.

Since 1908 there has been an irregular decrease in printing paper exports. In that year this commodity formed the largest single item in the export trade, but to-day it stands below both agricultural implements and motor cars:—

Year.	
1908	£189,791
1909	136,099
1910	158,624
1911	133,203
1912	179,173
1913	149,500

NEW CONVEYOR.

At the Laurentide Mill, Grand Mere, the big new steel pulp conveyer, designed for a mill capacity of 500 cords per day, started up at 6 p.m. on June the 24th. The conveyer is more than 1,200 ft. long with 2 steel towers of 187 ft. height and one shorter while the conveyer itself is 120 ft. above the ground at the foot of the towers.

FIRES OUT.

Complete reports received by the Ontario Department of Lands, Forests and Mines from the fire rangers in the North say that no forest fires are now burning. Heavy rains have recently contributed to their extinguishment. There are between five and six hundred rangers employed by the Government, besides those in the services of timber licensees and the various railways.

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Montreal

CONSERVING TIMBER IN ALGONQUIN PARK.

The Ontario government some few years ago entered upon a policy of conserving the timber resources of the province, and naturally their eyes were turned in the direction of Algonquin Park to see what could be done to bring back into the Crown free from any private control by timber license or otherwise certain areas which had been cut over or partly cut over.

In pursuance of this idea the Crown purchased from the Munn Lumber Company its rights to licensed territory covering 350 square miles almost entirely within the park, for which the sum of \$290,000 was paid. At the time the park was set apart originally, nothing had much value except the pine, as the region was remote from railway connection, hardwoods were not flodable, and hemlock and spruce were not in demand, so that pine was really the only timber of value. Since then railways have pierced the park and all timber has taken on a considerable value, and there is every prospect that all varieties of timber in the park will greatly appreciate in value in the future. There are large quantities of birch, hemlock, spruce and balsam, which are valuable woods not only for lumbering, but for chemical purposes, and there is a chemical plant in process of erection near the park which will no doubt reach out for supplies of timber wherever they can find it available or purchasable, and if an operation of this kind gets a footing in the park, the ground covered by its cutting will be swept clean.

It was considered a good move to purchase the Munn Lumber Company's limits, because devastation was threatened by their cutting of all kinds of timber down to a very small diameter, to have permitted

which would have destroyed the park, and it might as well have been abandoned.

Mr. Ambrose White, deputy minister of lands and forests, expresses in his report the opinion that every effort should be made to preserve the timber in the park by quieting all lumber titles where they can be purchased at a reasonable price, for in another generation not only will the timber so preserved have increased enormously in quantity, but also in value, and with proper protection, and regulations as to cutting, a large revenue and a considerable supply of timber for provincial needs will be available. It would be an act of vandalism to allow this magnificent park to become a total waste, as it infallibly would if all the timbers were permitted to be cut for even the next 15 years. The park should be extended. There are several localities outside it that ought to be brought in, notably on the east, because these territories are unsuitable for settlement. Settlement should not be allowed in them, and the territories should be brought into the park free of licenses if they can be obtained on equitable value.

There are some licensees who have expressed their willingness to sell at what they call reasonable prices—the Hawkesbury Lumber Company, Messrs. Gillies Brothers, and the Pembroke Lumber Company.

Fire broke out in the slasher house at the top of the incline bringing lumber from the mill to the sorting table, at 1.30 a.m., on Sunday, June the 28th, and threatened one of the cableway towers used in work on the new dam, the sulphur house and a nearby pulp shed. Employees, however, quickly put it under control so that the loss was slight and that entirely covered by insurance. Since then, an addition to the threatened shed has been completed.

HUGO HARTIG

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SOLE AGENTS FOR UNITED STATES & CANADA

RECORD YEAR IN TIMBER PRESERVATION.

The most notable progressive yet recorded in the chemical treatment of timber to prevent decay was made in 1913, according to a report recently issued by the American Wood Preservers' Association in co-operation with the forest service of the Department of Agriculture.

The report states that 93 wood-preserving plants in 1913 consumed over 108,000,000 gallons of creosote oil, 26,000,000 pounds of dry zinc chloride and nearly 4,000,000 gallons of other liquid preservatives. With these the plants treated over 153,000,000 cubic feet of timber, or about 23 per cent. more than in 1912. The output from additional plants unrecorded would increase the totals given.

Impregnation of wood with oils and chemicals to increase its resistance to decay and insect attack, the report goes on to say, is an industry which has become important in the United States only in recent years. In Great Britain and most of the European countries practically every wooden cross-tie and telephone or telegraph pole receives preservative treatment. In the United States less than 30 per cent. of the 135,000,000 cross-ties annually consumed are treated, and the proportion of an annual consumption of 4,000,000 poles may be said to have scarcely commenced.

Real progress in the United States dates from 1852, when the Kyanizing process, using bichlorides of mercury, was developed. In 1857 two other processes were introduced, the Burnett process using coal tar creosote. These last processes are very largely in use to-day.

The idea of timber preservation at first made very slow growth in this country, on account of the large supply of cheap and durable timbers and the general disregard shown toward economy in the use of natural resources. In 1888 there were only three pressure plants in the United States, and in 1895 only 15. Since then, however, the industry has grown rapidly; in 1913 there were 115 plants.

AUCTION SALE OF TIMBER LIMITS

Re:- H. M. PRICE & CO.

Lumber Merchants, Quebec, Insolvent.

PUBLIC NOTICE is hereby given that on **WEDNESDAY, August 5th, 1914, at 10 o'clock A.M.**, the Timber Limits herein after mentioned will be offered for sale by Auction without reserve, at the office of Messrs. LaRue & Trudel, Accountants, Dominion Building, 126 St. Peter Street, Quebec:—

License No.		Sq. Miles.
181	River St. Jean Br. East No. 1	22
182	River St. Jean N.E. Branch No. 2	18
183	River St. Jean East Branch No. 3	20
184	River St. Jean, No. 7	12
185	River St. Jean, No. 8	12
186	River Saumon & Tribut River St. Jean	34
187	River Magpie, No. 3	32
188	River Magpie, No. 4	32
189	River Magpie, No. 5	32
190	River Magpie, No. 6	32
191	River Magpie, No. 7	32
192	River Magpie, No. 8	32
193	River St. Jean, No. 1	24
193	River St. Jean, No. 2	24
194	River St. Jean, No. 3	23
195	River St. Jean, No. 4	23
196	River St. Jean, No. 5	20
197	River St. Jean, No. 6	20
198	River Magpie, No. 1	32
199	River Chambers, No. 1	36

A total of 527 square miles more or less. Also a certain area of freehold land to be used as a mill site and fully described in deeds in the hands of the undersigned curators.

Conditions of Sale:—Ten per centum cash on adjudication, the balance payable upon transfer of the licenses, which transfers will have to be made at once, the transfer fee to be payable by the purchasers.

The purchaser will pay in addition to the purchase price, the auction duty of one per cent and will accept the licenses as they are without any responsibility on the part of the estate as to the condition, area or quality of the limits.

For inspection of the licenses and other particulars please apply to the undersigned:—

A. F. C. ROSS (Messrs. P. S. Ross & Sons),
142 Notre Dame St. West, Montreal.
EUGENE TRUDEL (Messrs. LaRue & Trudel),
Edifice Dominion, 126 St. Peter St., Quebec.

HOW TO DISSOLVE ALUM.

In many mills the alum is weighed and dried, and is thus added undissolved to the pulp. This process is simple, but incorrect, says the Papier-Fabrikant, especially as the weighing is frequently omitted. In this process variations in the admixture of alum can scarcely be avoided, and the necessary consequence is irregularity in the sizing. Consequently rosin size is frequently unjustly blamed. If it is wished to add the alum undissolved it should always be weighed and previously pulverised.

For all better quality papers the alum should certainly be dissolved. Two dissolving vessels should be used, the alum for use being taken from the one whilst the alum is dissolved in the other. The vessels are preferably made of wood or lead-covered metal, and provided with a double bottom, which is fixed near the top edge of the vessel, and provided with holes about 20 mm. in diameter. Always put the same quantity of alum on to this double bottom, which consists of wood or lead, and is dissolved exceedingly rapidly in the filled vessel. Iron vessels, even those of reinforced concrete, are not to be recommended, as they are destroyed in a short time. Frequently ordinary rosin-size casks suffice, one of which is so placed over each heater that the alum can run out directly into the heater. Also the alum may be wrapped up in clean cloths and suspended in the casks. The pipes and cocks must be of lead. The alum solution should be filtered, if possible, before being used.

Pulp and Paper Magazine

A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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A. G. McINTYRE, B.A., B.Sc., Contributing Editor.

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VOL. XII.

MONTREAL, AUGUST 15, 1914

No. 16

The War

The great European conflict is begun, and all the world stands in breathless apprehension of the havoc that may be wrought. In two weeks' time the civilized nations have been completely changed over from industrious active peoples to devotees of Mars, in a supreme struggle whose outcome should be the eradication of that most troublesome and harmful element in the world to-day—German military despotism and autocratic rule. "An outbreak of barbarism," President Poincaré of France calls Germany's violence. The cost of the effort may be such as humanity has never before witnessed, but if democracy can establish itself over the "divinely-invested" Hohenzollerns and their pernicious rule, the ultimate result will be worth the sacrifice.

Never before have the nations come so abruptly face to face with the fact that the world is one, and that national boundaries are subsidiary to economic considerations. Germany gets no more flour from Russia; Britain, temporarily at least, gets no cotton from the Southern States; Canada gets no manufactures from Germany; France, Britain and the United States secure no pulp from Scandinavia and Germany, and so on through practically every class of commodity, which have for so many years been borne along the mighty channels of international trade. There will indeed be a cause for rejoicing if the war can be brought to a speedy close. May the bloodshed and the starvation not be great!

The question of the length of the war is the all-absorbing one. The general consensus of opinion is that it can not possibly last more than a year, with six months ventured as an estimate of the probable conclusion, and three months as well within the range of possibility. If half a year does not see the cessa-

tion of hostilities, it is altogether probable that our industrial life will be wrecked to an extent which we at the present time can hardly imagine. Secondary industries must necessarily give way to primary industries, because the bare cost of maintaining the fifteen millions of men in the necessities of life will cause a complete change from one class of production to another.

In the pulp and paper industry this question of duration is practically the main one. So far as America is concerned, as we stated in these columns in our last issue, there will probably be a curtailment of nearly all of the 450,000 tons per annum of pulp which come from across the water to America. Just how long the pulp industries in America can stand this loss, depends upon the length of time it is continued.

Sulphite is the point upon which this present situation largely devolves. If our digesters can be made to produce the requisite amount, American paper makers need not have any great fear for the demands which will be made. It is well known that sulphite manufacturers of the country have not been manufacturing to the full extent of their possibilities for a considerable length of time. This is as true of Canada as it is of the United States. Further, in Canada at the present time there exists a possibility of further increase through the operation for the first time of at least two new sulphite plants. A prominent news print manufacturer indicates that it is practically impossible to size up the situation at the present moment. He says that, "All that can be done is to speculate with more or less ingenuity." This statement certainly applies to the new orders which may come in to the news print manufacturers. For the old business under contract, it is altogether likely that there will be practically no change in prices or quantity since it would be shortsightedness on the part of paper makers to urge upon

the newspapers a higher price for that amount of paper by which contracts for a minimum are exceeded.

The feeling is strong among the officials of large companies that there is unquestionably going to be an unprecedented demand for newsprint during the continuance of the war, and while contracts will naturally be filled at their old prices, with the higher prices which will probably be demanded for sulphite and the advance to a normal basis of the prices on ground wood, manufacturers will be compelled to advance their spot quotations for new business.

Both in the United States and in Canada, mills which have been manufacturing other grades of paper such as wrapping, book and specialty will be turned to the manufacture of news print, and coupled with the present stocks including those in transit storage and the slack, there will be sufficient to supply all moderate needs. So far, despite the increase of from 50 to 160 per cent in the tonnage consumption of the metropolitan dailies there has been not the slightest apprehension on the part of newspaper managers. There is still plenty of room for the newspapers to cut down their head lines and use for the purposes of news instead of mere scare heads, white space which may prove so valuable. While it is probably true that the United States dailies can afford to pay a higher price for news print than Canadians, owing to the greater bulk of the manufacture and the practical certainty of an unusual heavy crop and open markets in South America for which American industries are clamoring at the present time, the cessation of the export of news print from the United States to Europe will minimize very heavy drains on Canada. Further, publishers are overbought and the keen competition of recent months will be replaced by normal conditions such as existed before the present financial stringency overtook America.

In the finer grades of paper there is still more room for speculation than in news print. The buoyancy of trades which are accustomed to advertise and make use of good papers is still problematical. The principal difficulty will come through the cutting off of supplies of cheap rags, china clay and dye stuffs as well as sulphite, great quantities of which have always been imported from Europe. In Canada the outlook as a whole is optimistic, even though a temporary derangement may be anticipated. The pulp and paper industry should sustain the shock of strife as easily as any other.

In Canada the sentiment is practically universal that the war is with the German governmental system, not the German people. No tribute is too high for the industry and inventiveness of the Teutons. In science and industry German scholarship and cleverness are the marvel of all. It is indeed a shame that such talents are to be forced into the channels of warfare to destroy and be destroyed.

Practical Forestry

In this issue of the Pulp and Paper Magazine, we have the peculiar privilege of presenting an account of developments along lines of forestry which give promise of being one of the foremost enterprises in the country in the maintenance of a perpetual supply of pulp wood. Up in the heart of that belt of territory which many an orator has dilated upon as a source of unending timber supply, a commercial company, which has at heart the earning of dividends for many years to come, and the support of a manufacturing institution of such a nature as requires an enormous investment of capital is actually planting seeds in the hope and expectation of reaping a crop of material which will keep them in perpetual comfort from the standpoint of raw material.

To Mr. Ellwood Wilson, Chief of the Forestry Division of the Laurentide Company, Canada cannot give too much credit for his enterprise and zeal along lines of forestry investigation and forestry practice. The fact that he has the support of the business management of the Company is one of the clearest indications of his far-sightedness and his keen appreciation of the value of scientific forestry. At the present time the wood consuming industries of Canada stand in very great need of just such work, and that the science and art of forestry such as is practised in continental countries has evidently a very excellent chance of becoming deep-rooted in Canadian soil is cause for the greatest satisfaction among manufacturers, conservationists and the public at large. The institution of forestry practice on a strictly commercial basis in our wood lands is undoubtedly an epoch-making event in our industrial development.

EDITORIAL COMMENT.

Since the beginning of the war Britain, France and Germany have been practically without paper. The paper famine has already set in, in France, and newspapers there have either ceased publication or are running two, four and, at the most, six pages of a reduced size. It appears that only a naval engagement and the clearing of the North Sea of menacing German ships can give Great Britain her needed supplies of pulp from Scandinavia. Otherwise an acute paper shortage is a certainty.

• • •

The Canadian and American China Clay industry should receive a distinct impetus in the present crisis. The deposits have been overlooked in favor of the Cornwall article, but the demand should stimulate our own producers into meeting the requirements of paper and textile manufacturers.

• • •

Makers of Fourdriner wires in the United States believe that their industry will be greatly advanced, through the cutting off of the German wires, which have been taking such a firm hold upon the market.

COMMERCIAL PLANTING OF SPRUCE

Laurentide Company starts in on extensive programme to create for itself a perpetual supply of pulpwood. A square mile a year to be planted with 600,000 to 800,000 trees.

By B. K. AYERS, M.F.

(Written specially for Pulp and Paper Magazine.)

The Forestry Division of the Laurentide Company has been in existence for about ten years now. For most of that period, the survey work has taken about all of its time and appropriation. This work, the mapping of water and timber on 2,350 square miles of limits, the running out, cutting and blazing of the limit lines; the estimate of the timber; and the other odd pieces of work such as survey of lots, trespasses and cuttings; has been almost finished. August 1st will see the end of the mapping; all but 120 miles of the outside boundaries have been run out and cut; and the mapping of cuttings is up to date.

During this time, the Division has also done a lot of the more technical forestry work, such as careful estimating, construction of volume tables for white and black spruce, balsam and white pine, growth studies of the same species and of jack pine and various studies of the past and present methods of logging, with an eye to their continual betterment. Many of the ideas of the Division, have, after careful consideration, been adopted; the logging goes on improving as to the am-

ever, but cold hard figures show that even this immense holding is inadequate, and that it will all be cut out in a term of years variously estimated at from 50 to 75. This still distant end of the present supply, and the possibilities of planting as a provision for the future, have long been foreseen by Mr. Chahoon, vice-president of the company, and, in keeping with his far-sighted and broad-minded policy, the company has decided to undertake planting operations.

Now away back in 1908, Mr. Wilson made the first plantations near Grand Mere. These plantations were of necessity very small. The first year they consisted of about 20 acres of white, jack and Scotch pine (see illustration). Each year since then some planting has been done. These latter have experimented with the pines, white and Norway spruce and European larch. Most attention was given to those trees which are used for pulp. For that purpose there are four species, three of them natives and the other a European, black and white spruce, balsam and Norway spruce. These have all been tried out here, both as to raising the small



Laurentide Company's Nursery at Grand' Mere now contains about 500,000 trees. Will be enlarged this fall to three times that capacity to supply 750,000 2-yr. seedlings yearly.

ount of tops, skids, etc., removed from the woods; the stumps are cut lower; and the more inaccessible timber, which has often been left in the past, and is being left to-day by many of the neighboring companies, is being cut and driven to the mill.

From the first, the idea of Mr. Wilson, Supt. of the Division, was that planting was the ultimate solution of the production of timber. Now it is not to be expected that a planting policy would be accepted by the Company without a great deal of discussion and opposition. Canada's supply of pulp wood is the greatest in the world. The St. Maurice Valley includes 15,000 sq. miles of the most accessible pulpwood in the Dominion, lying in a very favorable location with regard to water power sites as well as easy shipment, and the Laurentide Company's 2,350 square miles is of the best of this. Most people would think that this amount of territory would keep the mill in logs for

trees in the nursery and the planting of them in the field. Seeding direct in the field has also been tried, but with no success.

In this way, the three native species have been found to have serious drawbacks the black spruce that it grows very slowly, the white spruce and balsam, that they are hard to get started and to raise in the nursery. On the other hand, the Norway spruce is a very rapid grower and at the same time is very easy to grow in the nursery.

Experiments also proved that trees bought from outside nurseries are not at all satisfactory, the native Canadian stock rather inferior in quality and the American stock not adapted to this climate. (The New England stock, which is best fitted, is forbidden entry into Canada, because of the fear of the spread of two pests prevalent there, namely the gypsy moth and the blister rust of pine. On the other hand, plants grown

on the ground are strong and hardy, and if grown in sufficient quantity, can be grown here cheaper than they can be bought.

Following these conclusions, a nursery was started in Grandmere in 1912. That year but two seed beds were made, and the press of other work caused these to receive less than their due of attention. But in 1913 a competent man was put in charge for the season, one acre of land in the edge of town was fenced off, a water system was put in and 41 beds were made

This outlines the situation both in the survey and in planting up until 1914. With the former work well in hand, the fire protection taken care of by a co-operative association, the St. Maurice Fire Protective Association, and time being ripe with regard to planting, the latter had to be tried out on a more extensive scale than was formerly possible.

With only 10,000 trees available from the nursery, 100,000 three-year old Norway spruce seedlings were ordered from the Pejepscot Paper Co., of Cookshire,



Scotch pine planted in 1908 near Grand Mere.

and sown, 15 in the Spring, and 36 in the Fall. The planting done in 1913 was also much more than in the previous years, being about 20,000 trees of Norway spruce, white spruce, white pine, Scotch pine, and European larch. The season was particularly dry and unfavorable, and the results very disappointing, but for all that immensely valuable for the lesson taught.



Land formerly having pure stand of pine, cleared for farm 10 years ago but soil too poor and so abandoned. A class of land that never should have been cleared. Planting trees is the remedy.

One of these is the one that I have already mentioned, that only living green stock can be depended on. Another, that spruce can not be planted upon the open sandy fields with success unless the season is favorable, and a third, that Fall seedling and planting are preferable to Spring planting and seedling.



Clear burn of Laurentide Company's limits on Upper St. Maurice. Burned over repeatedly, taking most of the soil. Reproduction poor and scattering. Jack pine, poplar and white birch all of small value for pulp, coming in much faster than the desired spruce. Remedy: First keep out the fire; then, where possible, plant.

and all preparations were made to plant them as soon as the ground thawed, a part to be put in right on the edge of Grand Mere itself, but most of them on the company farm, 6 miles up the St. Maurice. A man was



Underplanting young poplar and white birch with Norway spruce—Laurentide Company, May, 1914. Ideal conditions for spruce. The poplar and birch afford perfect protection for the spruce and in 5 years or so will either die out or be overtaken in growth by the spruce, which will then occupy the whole space.

sent down to Cookshire to look over the plants and to inspect the shipping.

The first shipment of 25,000 trees arrived in Grand Mere on May the 6th, when snow was still on the ground in many places. Planting was, however, immediately started on a warm south slope with a crew

of eight Italians, and supplemented by four boys, who worked after school in the afternoons. 15,800 trees were put in on 10 acres in a week.

In the following three weeks planting was carried on at the Farm with a crew of Italians that averaged 12. There, 74,850 trees were put in on 54 acres for a total cost of \$807.25, which is \$10.76 per thousand trees and \$14.95 per acre. This plantation is interesting in a number of ways, consideration of which necessitates a description of the area planted.

The "farm" lies on the West bank of the St. Maurice, and the larger part of it is a flat-lying sandy land, 150 feet above the River. This land for the most part was formerly covered with a pure stand of white pine,



3-yr. Norway spruce seedlings planted in May, 1914, on ground burned clear in 1910. Trees did excellently, and many of them made up a growth of 8 inches to 1 foot by the last of July. First pulp should be cut from this plantation as thinnings in 15 or 20 years, and expected to cut 50 cords per acre in 50 years.

which was cut off, and the area afterwards burned over, some 12 years ago. While sandy on the surface, the sand is underlain with clay, and there is plenty of water down 6 or 8 feet, as shown by the wells on the neighboring farms, and by the swamps on an adjoining tract of but very little lower level.

After the fire which followed the cutting of the pine, the tract grew up to white birch and poplar, and it was this young rather open stand that was planted, the idea being that spruce planted in the partial shade of the birch and poplar would be able to become established, even on the dry sandy soil, while if planted in the open, as was done in 1913, it would dry out before the roots could get down to the water and would die the first season. Once established the spruce will grow well in the partial shade, and if necessary the birch and poplar can be cut out when large enough (say in ten years) for pulp or cord wood.

The planting, as has been said was done by Italians: from three to five men went ahead, each with a mattock first clearing off a place for the plant, and then making a hole from 6 in. to 1 foot deep. Each man took a single row, the first man keeping approximately 5 feet from the previous line and the others following him, keeping five feet from the man next in front. The rest of the crew followed, each with a bunch of trees kept wet in a pail of mud and water, or in a small

piece of burlap wrapped around the roots. This method is rather slow but was thought necessary, because of the large size of the trees, some of which were 12 in. or more in height, and because care was needed on this unfavorable site.

The cost as given was \$14.95 per acre, divided as follows:

Cost of trees	- - - - -	\$4.16
Express on same	- - - - -	0.53
Labor	- - - - -	8.11
Supervision	- - - - -	0.96
Miscellaneous	- - - - -	1.16

the last item covering the expenses of man to inspect the trees and their packing, carting trees from R. R., and expenses of the man in charge.

This analysis shows where the reduction can be made in the future planting. Two year old seedlings raised in the Grand Mere Nursery will cost not over \$1.50 per thousand or \$1.75 to \$2.25 per acre. The express item can be eliminated or reduced to not over 10c. per acre. Labor, the biggest item, can be materially cut down by using smaller trees, and boys to put them in, so that this item should be reduced to \$5 per acre. Supervision is about right. Incidentals can be probably cut in half, so that future planting should be done at a figure of from \$8 to \$10 per acre.

The company nursery at Grand Mere has been enlarged to 115 standard (4 ft. by 12 ft.) seed beds, and a better water system put in. From this nursery about 25,000 two-year-old seedlings will be ready in the Fall of 1914, or Spring of 1915, and about 500,000 trees every two years or 250,000 a year is sufficient to plant about 200 acres a year. Seeding was finished this



Italian planting crew putting in trees on side hill. Two men with mattocks.

year on June 18th. At that date half of the beds seeded had already germinated, and on July 1st all the seed was up.

Plans are already on foot for the purchase of 50,000 more Norway Spruce seedlings to be planted this Fall with the 25,000 from the Company nursery. Next year (1915) between 250,000 and 300,000 trees will be put in, thus leading up to a planting program of 500,000 to 750,000 or some 400 to 600 acres each year.



NEW PATENTS



**Drier-Rolls for Paper Machines—William Sheahan,
Oregon City, Oregon, Inventor; Patented
July 21, 1914.**

My invention relates to paper making, and particularly to paper making machines wherein the paper web after leaving the press rolls is run over a series of drier rolls between drier felts. In the first stages of these machines the leading end of the paper web had to be thrown between the felts by the operator, in order to conduct the paper web from one to the other of the drier rolls. In the latter improvements, endless tapes were provided for conveying the leading end of the paper web from roll to roll. The difficulty with such means of conveying the paper web from roll to roll is, that it lacked means for causing the tapes to run at the proper speed relatively to the roller over which they are running, and in consequence there was

of the drier rolls; Fig. 2 is a side elevation, partly in section, of one end of one of the drier rolls, illustrating the construction of the sunken peripheral surfaces for carrying the tapes by which the leading end of the paper web is conducted from one drier roll to the other; and Fig. 3 is a view similar to that shown in Fig. 2, showing that the sunken end may be made integral with the drier roll, instead of being obtained by means of an attachment to the ends of the drier rolls, as shown in Fig. 2.

In Fig. 1, a represents diagrammatically a plurality of drier rolls journaled in staggered form, positively driven in the direction indicated by the arrow in this figure by suitable means, not shown in the drawings. The endless drier felts b run over the idler c, and over and with said drier rolls, the felts being moved by their frictional contact with the drier rolls.

Referring now to Fig. 2, this shows pieces as bolted to the ends of each drier roll, the end of the drier roll not shown being understood to be identical with that shown. The purpose of such end pieces, d, is to provide peripheral surfaces at the ends of the drier rolls sunken below the peripheral surface of the main body of the roll, for carrying the endless tapes by which the leading end of the web of paper is carried from one drier roll to the other. The tape carrying faces of said sunken surfaces must be located in a plane determined by the thickness of the tapes, so as to cause the latter to travel at the same speed as the carrier rolls by which they are supported. At the starting end of the drier section, having reference to the left end of Fig. 1, is provided the usual "baby drier" which is understood to be located directly in front of the press rolls (not shown), and the paper web, g, is supposed to be fed from

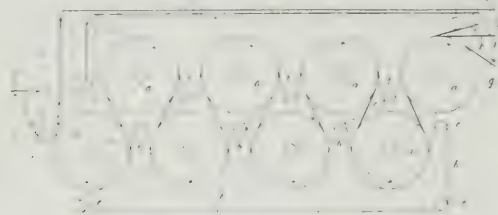


Fig. 1

a tendency of the web of paper being torn. The tapes for conveying the paper web from one driver to another could not be successfully run on the periphery of such drier rolls for several reasons which are manifest when pointed out; for example, if the tapes are run on a surface lying in the same plane as that on which the drier felt is running, the latter would have a tendency to run on the higher surface produced on the periphery of the drier roll by the tapes, and the tapes, running over the web of paper, having a slightly greater speed than the drier rolls, would have a tendency to tear the paper web, especially at the point where such overlying tapes pass from one drier roll to another. Furthermore, the edges of the paper web nearest the tapes are held slightly spaced from the periphery of the drier roll, and thus there would be a tendency to cause imperfect drying of the paper web.

To avoid this annoyance and incidental loss is the object of my invention.

It is, then, my object by providing at the ends of the drier rolls peripheral surfaces sunken below those of the body of the roll, the tape carrying faces of the ends of such sunken surfaces being located in a plane determined by the thickness of the tapes, so as to cause the tapes to travel at the same speed as the carrier rolls while traveling on the latter.

The details of my invention are hereinafter fully described.

In the accompanying drawings, Figure 1 is a diagrammatic side elevation of the drier section of a paper machine, according to arrows the direction of travel

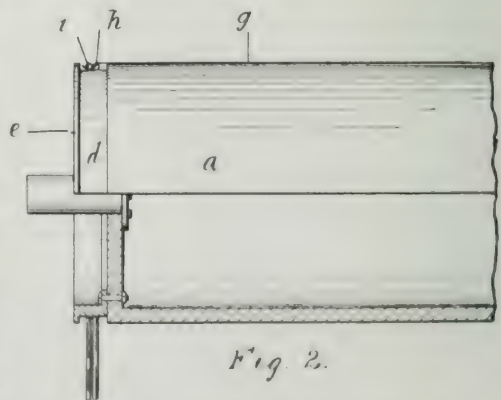


Fig. 2.

the press rolls to and over said "baby drier." The endless tapes or carriers b, i, run parallel, side by side, over all the drier rolls, in said sunken surface ends. I also prefer to make the sunken peripheral surface ends with flanges, as c, at their outer extremities. The tapes, b, i, are returned to the starting point over the idlers j, k. As the paper web g, is delivered from the press rolls its leading end is fed between the tapes or carriers

h, i. The paper web is thence conducted over the drier rolls to the calender end of the drier section, from whence it is delivered to the next section of the machine. As obvious, the paper web is carried over and around each driver roll without any attention being required from the operator. It may be found desirable

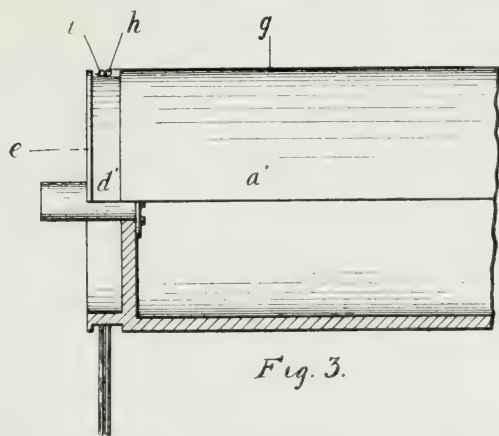


Fig. 3.

to make said surface ends integral with the drier rolls. In such case the construction shown in Fig. 3 will be found convenient. In this view the drier roll is represented by a, the sunken peripheral surface by d, and e represents the flange which I preferably provide to prevent the tapes from running off the ends of the sunken surfaces.

Bark-Rossing Machine—William G. Hafner, Clay, N.Y., Inventor; Patented July 7, 1914.

Specification of Letters Patent. Application filed December 18, 1912. Serial No. 737,383.

This invention has for its object the production of a bark rossing machine which is particularly simple in construction, and highly efficient and rapid in operation; and the invention consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

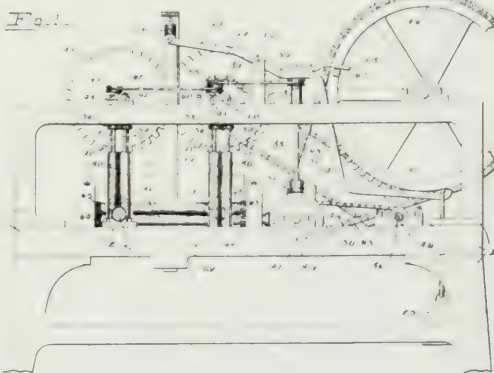
Figure 1 is a front elevation, partly broken away, of one embodiment of my invention. Fig. 2 is a side elevation, partly in section, looking to the right in Fig. 1. Fig. 3 is a fragmentary view of parts seen in Fig. 1, parts being omitted, illustrating particularly the means for gripping and carrying away the removed bark. Fig. 4 is a front elevation of the rotatable member carrying the bark removing means. Fig. 5 is a sectional view on line "A-A," Fig. 4. Fig. 6 is an elevation of a modified form of the bark removing means seen in Fig. 4.

This bark rossing machine comprises, generally, a rotating member having a passage through which the branches are passed, means carried by said member and projecting into the passage to remove the bark, means for carrying away the removed bark from one end of the passage of said member, means for feeding the branches through the passage, and means for actuating the feeding means, the rotating member and the means for carrying away the removed bark. However, some of the foregoing parts may be omitted if desired.

1 is the frame of this machine, which may be of any desirable form, size and construction.

2 designates the rotating member having an axial passage 3 through which the branches are passed, the member 2 having a hub 4 detachably secured as by screw threads to the body of said member 2, and this hub being journaled in a suitable bearing 5 formed in a supporting bracket 6 supported by the frame 1 near the front side thereof. The hub 4 is shown as provided with a peripheral surface for receiving the power to rotate the member 2, this surface being shown as sprocket teeth 7. In this embodiment of my invention, I have shown a double machine, that is, one having two rotating members 2, and double feeding and bark carrying away means, all driven from a common power shaft, and a description of one set of mechanism will be sufficient for both.

The means carried by the member 2 and projecting into the passage 3 for removing the bark from the branches comprises preferably a pair of jaws 8 projecting into the passage 3 near the receiving end thereof, these jaws being here shown as sliding in radially extending guides 9 formed in the front face of the member 2 and as being pressed toward each other by springs 10. The guides 9 are covered by suitable plates 11 which are held in position by screws 12. The jaws are formed with faces 13 inclining from their outer sides toward the centre of the passage and terminating in edges 14 which normally meet in a straight line crossing the passage and engage the branches, these faces 13 facing outwardly in order to engage the advance ends of the branches being passed into the passage 3. The faces 13 act together as a funnel to guide the branches between the jaws as the branches are being pushed into the passage 3, said faces 13 forming comparatively sharp edges on the opposing faces of the jaws 8; and owing to the rotation of the member



2 carrying the jaw 8, the edges loosen the bark, and owing to the feeding movement of the branches through the passage 3 the loosened bark is scraped off.

The springs 10 are located in lengthwise slots 15 in the bodies of the jaws and each spring is interposed between one end of the corresponding slot 15 and a pin 16 projecting from the bottom of the corresponding guide or channel 9 into the slot near the other end thereof, the springs being strong enough to overcome the centrifugal force of the member 2 and to press the jaws toward each other and hold the same engaged with the branches. However, as seen in Fig. 6, the jaws may be arranged with their heads located on the

opposite sides of the centre of the member 2 from the sides on which their body portions are located, in order that the centrifugal force may be utilized to draw the heads of the jaws toward each other.

The means for carrying away the removed bark from the entrance end of the passage comprises two members arranged on opposite sides of the passage, that is, above and below the same, one as the upper member being movable toward the other across the passage to grip the removed bark, at the entrance end of the passage, between the same and the other member, and the two members being then movable downwardly together until the bark has been carried away from the member 2, and said two members then separating permitting the bark to drop beneath the machine, whereupon the gripping members are returned to their normal position.

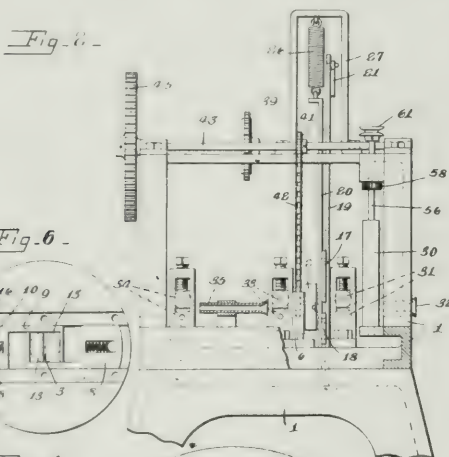
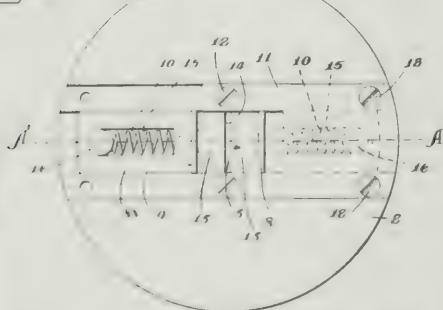


Fig. 6 -

Fig. 4 -



The gripping members consist of jaws 17 and 18 each respectively by reciprocating parts 19, 20, extend one upwardly, the support for the upper jaw 17 being connected to a lever 21, Fig. 1, pivoted between its ends at 22 to a suitable bearing supported by the frame 1, this lever 21 having an arm 23 arranged to be engaged by the power driven means to be described, and another arm 24 to which is connected a returning weight 25. The other support 20 is connected at its upper end to a returning spring 26 suspended from a yoke 27 at the top of the frame of the machine.

In operation, the jaw 17 is moved downwardly by the lever 21 across the passage 3 and grips the remain-

lated bark between its lower edge and the upper edge of the jaw 18, whereupon the downward movement of the jaw 17 is transferred to the jaw 18 until the jaw 18 engages a stop 29 provided on the frame. Fig. 3, when the weight 25 is permitted to raise the upper jaw and hence separating the jaws and permitting the bark to drop. The weight 25 and spring 26 then return the jaws to their starting position. The weight 25 is arranged to act quicker than the spring 26 so that the upper jaw will open faster than the lower jaw will close. The jaws 17 and 18 are controlled and timed in their operation by the projection 67 on the wheel 66 and the operator inserts the branch between the jaws 8 immediately after the jaws 17 and 18 have opened and as there is but one projection 67 and the wheel 66 is large and revolves comparatively slowly, there is ample time for the branch to pass through the member 2 before the jaws 17 and 18 again close. The jaws 17 and 18 for both rotating members 2 in the double construction here shown are supported by one set of supports 19 and 20.

The means for feeding the branches into the passage 3 includes two sets of rollers 30, 31, arranged in front of the passage 3, the rollers being arranged at an angle, usually at a right angle to each other, and the planes

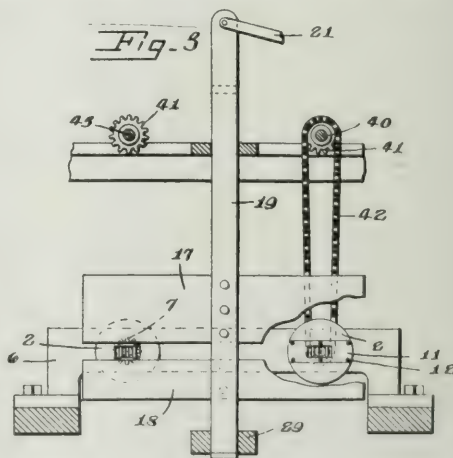


Fig. 3 -

coincident with the points of tangency of the pairs intersecting a line substantially coincident with the axial line of the passage 3. A guide as a tube 32 is also arranged in advance of these rollers with its axis aligned with the axial line of the passage 3. The means for feeding the rollers also includes means for drawing the branches through the passages, this means including two sets of rollers 33 and 34 spaced apart, and a tube 35 interposed between the pair of rollers and arranged with its axis substantially coincident with the planes of tangency of the rollers 33 and 34 and with the axis of the passage 3.

The actuating means includes a power shaft 36 journaled in suitable bearings in the frame, and power transmitting means between this shaft and the various moving parts of the machine.

The power transmitting means between the shaft 36 and the rotating members 2 includes a sprocket wheel 37 mounted on said shaft and connected by a sprocket chain 38 to a sprocket wheel 39 mounted on a shaft

40 journaled in a suitable bearing located directly above one of the members 2, additional sprocket wheels 41 on the shaft 40 and connected by sprocket chain 42, Fig. 3, to the sprocket teeth 7 on the hub 4 of the member 2.

The motion from the shaft 40 is transmitted to a similar shaft 43 which drives the other member 2, by means of intermeshing gear wheels 44 and 45 mounted on the shafts 40 and 43 respectively, and the shaft 43 is connected to its corresponding member 2 by a sprocket wheel and chain 41 and 42.

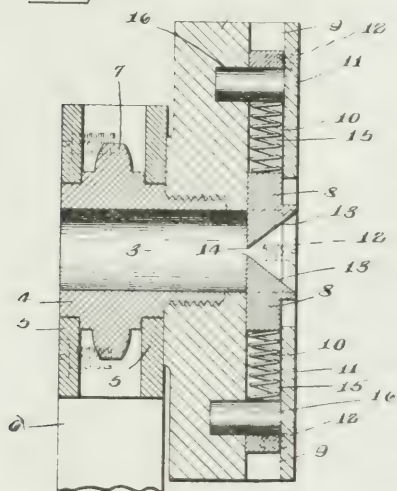
The vertical feeding rollers 30 are driven from the power shaft 36, by means of a sprocket wheel 46 on said shaft 36 and connected to a shaft 47, journaled in a bearing in the lower part of the frame, by means of a sprocket chain 48 running over the wheel 46 and a sprocket wheel 49 on the shaft 47, and the shaft 47 is connected to the first set of vertical rollers by means of a beveled gear 50 thereon meshing with the beveled

mounted on the ends of the lower rollers of each pair 33 and 34.

The means for actuating the lever 21 to depress the jaws 17 and 18 comprises a wheel 66 having a cam or projection 67 on one side thereof arranged to pass under the arm 23 of the lever 21 and hence raise the rear end of the lever against the action of the weight 25 and depress the front end of said lever to effect the operation of the jaws 17 and 18 as described. The wheel 66 is operated with sprocket teeth and is connected to a sprocket wheel on the shaft 47 by a chain 68.

In operation, the operator passes the branches into the passage 3 at the same time and during the rotation of the members 2, the bark is wholly removed by the jaws 8 and accumulates in front of the members 2 and the branches having passed through the passages 3, the jaws 17 and 18 descend and carry away the removed bark, the operator gauging the time in which he places the branches in the passages so that the branches will have entirely passed through the passage by the time the jaws operate.

Fig. 5-



gear 51 at the lower end of a vertical shaft 52 journaled in suitable bearings in the frame, and having a power-transmitting wheel as a pulley at its upper end which is connected by a belt 54 to a pulley 55 mounted on the upper end of the axle 56 of one of the rollers 30 of the first set of vertical rollers, the motion of the axle 56 being transferred to the axle 57 of the other roller by intermeshing gears 58 and 59. The axle 56 is connected to the axle 56 of one of the other vertical rollers by means of pulleys 60 and 61 mounted respectively on said axles and a belt 62 connecting the pulleys; and the rollers 30 of the second set are controlled by gears similar to the gears 58 and 59.

The horizontal rollers 31 are rotated by means of a beveled gear 63 mounted on the axle of one of said rollers 31 and meshing with the beveled gear 50, and the axles of the rollers are connected by intermeshing gears 64 and 65.

The shaft 47 extends from front gear of the machine and is provided with two additional beveled gears 50 located in position to mesh with the beveled gears 63

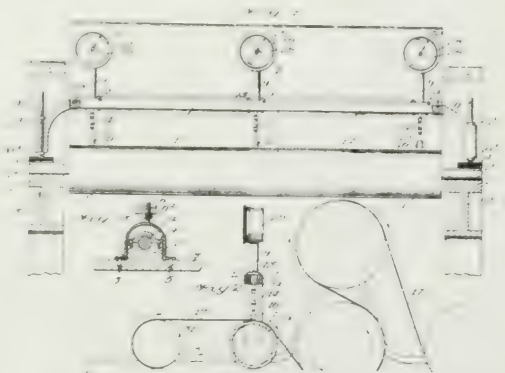
Paper-Making Machine—Duncan L. Leslie and John L. Harris, Roanoke Rapids, N. C., Inventors;
Patented July 21, 1914.

Specification of Letters Patent. Application filed April 24, 1913. Serial No. 763,334.

Our invention relates to improvements in paper making machines, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of our invention is to provide means for measuring or gauging the thickness of a sheet of paper just after it has been formed and when it is still in the wet state before being calendered.

A further object of our invention is to provide a gauge which may be turned so as to be readable from various parts of the room in which the machine is situated.



A further object of our invention is to provide means for indicating the thickness of the paper at any desired place.

A further object of our invention is to provide a special form of gauge which will register variations of 1/10,000 of an inch in the thickness of the paper.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

Our invention is illustrated in the accompanying drawings forming part of this application in which—

Figure 1 is a section through a portion of the device, the gauge being shown in elevation. Fig. 2 is a section along the line 2—2 of Fig. 1. Fig. 3 is a section along the line of 3—3 of Fig. 1. Fig. 4 is a vertical section through the guage on the line 4—4 of Fig. 5. Fig. 5 is a section along the line 5—5 of Fig. 4, and Fig. 6 is a section along the line 6—6 of Fig. 4.

In the making of paper, especially where the paper is made in strips of considerable width, it is the custom to provide a plurality of feed devices for properly dis-

which is not uniform in thickness is generally rejected and only that used which conforms to a certain standard thickness.

An object of our invention is to provide a guaging device which will gauge the thickness of the sheet of paper before it has reached the drying rolls so that proper regulation of the pulp feeding device may be made before the paper has passed over the drying rolls, thereby obviating the loss and delay formerly occasioned.

In carrying out our invention we provide a base roll 1 whose shaft 1x is mounted in bearings 2 on the main frame 3 of the machine. A yoke 4 is secured to the frame 3 by means of bolts 5 or in any other suitable manner as shown in Fig. 3. This yoke straddles the bearings 2 and is provided with an upwardly threaded arm 6. The arm 6 on each side of the machine form, together with the nuts 6x, supports for a transverse frame 7. The latter is provided with a longitudinal slot 7x, which extends for a distance approximately equal to the width of the sheet of paper to be formed.

Secured to the frame 7 and arranged to be adjusted in any position therealong are a plurality of guage members like those shown in Figs. 4 and 5. A description of one of these guage members will suffice since they are all alike.

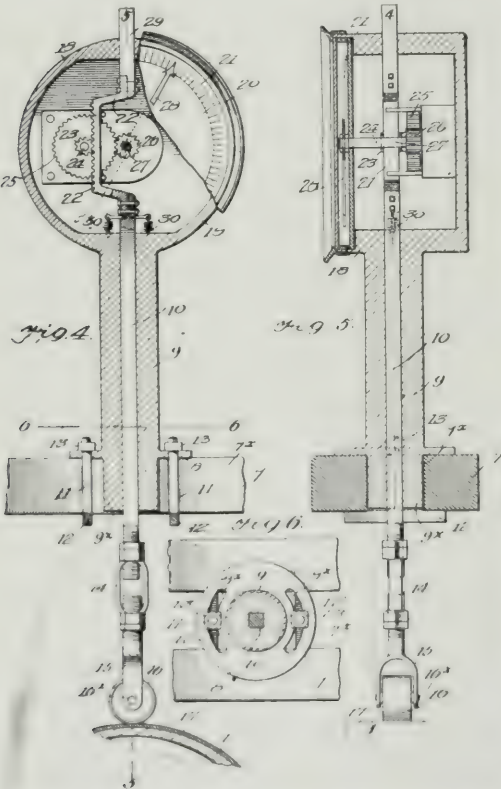
In Fig. 4 we have shown the guage as consisting of a base plate 8 arranged to support a central standard 9 which is provided with a central bore arranged to receive a rod 10. The standard 9 has a slightly reduced extension 9x at its lower end arranged to enter the slot 7x (see Fig. 6). The plate 8 is provided with a pair of arc-shaped slots 8x arranged to receive the threaded arms 11 which extend upwardly from integral cross members 12. The latter are disposed beneath the frame 7. Nuts 13 are provided for clamping the standard 9 in position.

The lower end of the rod 10 is threaded to enter one end of a turn buckle 14. A forked rod 15 is threaded to enter the other end of the turn buckle and bears a roller 16 which is arranged to engage the paper strip 17 as it passes over the base roll 1.

Carried by the standard 9 is a hollow casing 18, which is provided with a dial 20. The latter is divided by means of a graduated scale 21 so as to indicate a difference of 1/10,000 of an inch in the thickness of the paper. The rod 10 is secured to a U-shaped rack member 22, which engages a pinion 23 on a shaft 24. The latter bears a gear 25, which engages 26 on a shaft 27 bearing a hand 28. At the upper end of the U-shaped rack member 22 is a guide stem 29 which projects through an opening in the casing 18 for guiding the rack in its movement. Springs 30 are provided for exerting a downward tension on the rod 10.

From the foregoing description of the various parts of the device the operation thereof may be readily understood.

The paper sheet or band 17 passes from the press roll 31 over the base roll 1 as shown in Fig. 2. Gauges such as these described are secured to the frame 7 at various intervals along the frame. In Fig. 1 we have shown three of these guage members but it will be understood that more or less may be provided without departing from the spirit of the invention. As the paper passes underneath the roller 16 the thickness of the paper will be accurately registered by the guage. The hands 28 of these gauges should, of course, register the same thickness, but in case they do not it will be at once apparent to the operator which portion of the



presenting the pulp so as to form sheets of uniform thickness. In the initial run of a mill the finished paper sheet comes from the calender rolls is measured or gauged and if any particular part of the sheet, such as the centre, or a portion toward one edge or the opposite edge be found thinner or thicker than desirable, more or less of the pulp is fed from that particular feed point which corresponds with the portion of the sheet to be changed. In mills which employ modern machinery it will be seen that a considerable length of paper is actually wasted before the pulp feeding devices have been properly regulated. The paper

sheet should be fed more or less pulp. There is therefore no necessity of completing the drying and calendering of the paper and thus losing the paper which has passed the base roll.

By loosening the nuts 13 the standard 9 may be turned so as to face in any direction so as to be read from different parts of the room. The provision of the turn buckles 14 permits an accurate adjustment of the roller 16 so as to permit the axis 16x of the roller

to remain parallel with the axis of the base roll 1 even if the face of the guage should be turned at an angle.

The guages may be shifted along the slot 7x so that any particular portion of the sheet may be guaged. The guage members may be quickly removed or replaced. It will be noted that a very slight movement of the roller will be multiplied by the gearing so that a variation as small as 1/10,000 of an inch may be accurately registered.

The Compression and Density of Raw Materials Used in the Manufacture of Paper

By CLAYTON BEADLE and HENRY P. STEVENS.

Wood, in point of quantity, is the chief source of raw material for the manufacture of paper. Certain countries, like Scandinavia, Russia, Finland, Germany, Canada, United States, are big pulp producing countries, and what they do not require for their own use they export. Other countries, such as Great Britain and parts of the British Empire other than Canada, France, Italy, Spain, Austria, China, and Japan, which are big paper making countries, depend on outside sources of supply of wood pulp. As supplies from such countries come from long distances over the seas, freight is a matter of great importance. The freight is largely determined by bulk, and therefore the question of density, not only of bales of wood pulp but also other forms of paper making raw materials, is of very great importance. There are several fibres that would be worth while considering as raw materials in the manufacture of paper if it were not for their excessive bulk, which would put such a freight upon them as to render the cost of delivery into this and other importing countries prohibitive, in spite of the fact that such materials may be had for the asking in the localities where they grow. Straw as raw material in the manufacture of pulp and paper has been killed in this way in England. Esparto, which is a somewhat bulky material, has the compensation of cheap back freight from the shores of the Mediterranean.

The question of bulk in the natural state of growth or gathering is of secondary importance, provided that a high density by compression can be obtained at a reasonable cost. The object of this communication is to show what densities are commercially obtainable with a few of the paper making raw materials.

Table A.—Density Equivalents.

Cubic ft. per ton.	Lbs. per cu. ft.	Sp. gr. (water=1.00)
23.8	93.7	1.500
25	89.6	1.433
30	74.7	1.195
35	64.0	1.024
40	56.0	0.896
45	49.6	0.796
50	44.8	0.717
60	37.3	0.597
70	32.0	0.512
80	28.0	0.448
90	24.9	0.398
100	22.4	0.358
110	20.4	0.326
120	18.7	0.300

130	17.2	0.275
140	16.0	0.256
150	15.0	0.240
200	11.2	0.179
250	9.0	0.143
300	7.5	0.120
350	6.4	0.102
400	5.6	0.090

Table A gives equivalents in cubic feet per ton and pounds per cubic feet, and density or specific gravity (water = 1.00). This table will be found useful for reference when considering the subject generally. As cellulose and vegetable fibres generally, as used or available for use in the manufacture of paper, possesses a specific gravity of 1.500, or a figure very closely approximating thereto, any cellulosic material compressed to its final condition so as to eliminate all air space would have a gravity of 1.500 and would weigh 37 lbs. to the cubic foot = 23.8 cubic feet per ton. This figure is inserted at the top of Table A in order to see how nearly highly compressed bales approach to the ultimate condition of compactness, and by the aid of such figures it is easy to calculate from any density obtained by hydraulic pressing the percentage by volume of air space and fibre. Compression of this order, i.e., approaching the complete elimination of air space, is brought about when paper is highly compressed for coverings of calender bowls, or for structural work, as for the interiors of railway waggon wheels; but this compression is never quite to the extent of eliminating the whole of the air space.

In practice, for the baling of raw material to be used in the manufacture of paper, the extent of compression is limited (a) by the cost of compression, (b) by the condition of the material when compressed, and (c) the question of deadweight. Heavy compression within limits can be brought about at a reasonable cost per ton, but the first cost of installation is greatly augmented if high compression is to be resorted to. High compression cannot be done cheaply unless operated on an extensive scale, and the hydraulic presses are heavy, but it is a comparatively easy thing to give a medium compression such as 20 to 25 lbs. per cubic foot, even by hand or horse labor and with comparatively inexpensive light and portable presses. Then, again, the compression must not be carried to the extent of destroying or damaging the paper making qualities of the raw material. High compression with some materials is very detrimental on account of the breaking up of the fibres during the compression. For instance, an ex-

cessively high density in the case of esparto would be destructive, and would make it very difficult to conduct the subsequent operations of opening up, dusting, etc., preparatory to boiling. There is a limitation here in the amount of compression, which is of necessity much less than in the case of chemical or mechanical wood pulp, but with cotton-seed cotton, which is discharged direct from the bales into the boiler, high compression such as can be obtained by the most powerful hydraulic presses is, in our opinion, of no detriment provided that the material is sufficiently broken up to ensure the complete penetration and circulation of liquor during the process of boiling. The same may be said of "Hedychium coronarium," and, as will be hereafter seen, this fibre is capable of very high compression without destroying or impairing its paper making qualities. Table A ranges from completely compressed cellulose materials to materials in a loose unbaled or piled up condition.

The third limitation point in regard to compression, namely, deadweight, must not be lost sight of. Since deadweight comes in at 40 cubic feet per ton (=56 lbs. per cubic foot), there is no use compressing beyond this point unless it be, perhaps, for land transport and storage in warehouse and factory.

Table B.—Comparative Densities of Different Raw Materials used in the Manufacture of Paper.

	Cubic ft.	Lbs. per
	per ton.	cubic ft.
Esparto bales.	120	18.7
Do. Hydraulic press	90	24.9
Moist "mechanical" wood-pulp (50	44	51
per cent water.	36	61
Do. mean	40	56
Do. Equivalent dry weight	80	28
Moist "mechanical" wood-pulp (50		
per cent water.	40-45	56-50
Do. Equivalent dry weight	80-90	28-25
Chemical wood-pulp (sulphite), ord-		
inary compression, air dry	65	34
Best practice for sulphite, air dry. .	50	45
Chemical wood (soda) kraft, dry . .	80	28
Chemical wood-pulp (sulphite), dry		
by measurement and weight of	61.6	36.4
bales in mills.	54	41.5
Do. Mean	57.8	39
Hedychium coronarium, continuous		
light baling press	90	25
Do. "Heavy"	64-56	35-40
Do. Heavy hydraulic presses. . . .	37-38	60-61
Do. Greatest compression obtained		
with bales (dry)	33-34	66.0
Do. Wet	33-34	66.8

Table B shows a comparison of densities of different paper making materials. It will be noticed that the lightest material is esparto. Moist mechanical wood pulp reaches deadweight, but inasmuch as it contains 50 per cent of water a dry ton has a volume of 80 to 90 cubic feet. Serious attempts have been made in modern pulp mills to compress to 40 per cent of moisture, but it is doubtful whether this will be accomplished economically. There appears to be a greater uniformity of compression in the case of "mechanical" than with "chemical" wood pulp. This may be due to the fact that in the case of mechanical a definite amount of moisture is aimed at, namely, 50 per cent and this is regulated by the amount of compression. There is also the important difference that mechanical is pressed moist and chemical compressed dry. "Soda" or sul-

phate pulp, as might be expected, gives less compression than sulphite; the sheets of sulphite are made compact before baling, but the amount of compression, whether for chemical or mechanical, varies with different mills, according to the power installation and the qualities of the pulp-wood as well as the wood-pulp operated upon. There is a great difference in the qualities of "sulphite" and "soda," one being much harder than the other, and mechanical varies very much in its qualities according to the sources of supply, the mode of grinding, and so forth. The mean results for moist mechanical, taken by us from different sources, show practically the same figures, i.e., 40 cubic feet per moist ton = 56 moist pounds per cubic foot, which is deadweight. The first figures given for moist mechanical show how the density varies between individual bales, the second figures were arrived at from measurements made in bulk.

Hedychium baling was tested first of all in continuous light baling presses. The Hedychium operated upon was in the condition as shipped from Brazil, i.e., after passing through crushing rolls and drying prior to shipping, that is in the form of a loose tow. Hedychium as piled or packed loose has a density of about 5 lbs. to the cubic foot. On packing into digesters it will occupy about 10 lbs. per cubic foot. With Howard's Dreadnought heavy continuous presses it gives bales of a density of from 35 to 40 lbs. per cubic foot; with lighter presses of the same type 25 to 30 lbs. per cubic foot. Either the light continuous or heavy Dreadnought presses will bale material at the rate of 20 tons dry weight per diem. For greater densities it is advisable to employ hydraulic pressure. With heavy compressions with hydraulic presses 60 lbs. per cubic foot is obtainable, which is more than is necessary for deadweight. In order to see what was the greatest density obtained with Hedychium, pressures of over 1 ton per square inch were employed on small bales at the works of Messrs. Howard and Sons. The highest compression for dry Hedychium in the form of bales was 66 dry lbs. per cubic foot. This compression is not detrimental to the qualities of the product. In this condition of baling it can be used for the manufacture of paper, and without these qualities having been impaired as the result of high compression. For moist Hedychium we obtained bales containing 66.8 moist lbs. per cubic foot.

Table C.—Laboratory Baling Tests with Hedychium.

	Grms.	Lbs. per
	per	cubic ft.
Raw dry Hedychium, pressed in Cider		
Press		
Packed before pressing	0.089	4.4
Do. Whilst under pressure	0.355	17.6
Boiled Hedychium, pressed in Cider		
Press		
Gross weight (68 p.c. moisture) . . .	1.20	75.0
Equivalent dry weight	0.385	24.0
Baling in iron cylinder		
Raw dry, under pressure	1.24	77.5
Do. Pressure released	1.00	62.5
Raw wet (47 p.c. moisture), under		
pressure. Dry weight	1.00	62.5
Do. Pressure released. Dry weight . .	0.71	44.4
Ordinary pressing without a "former"		
Gross weight (55 p.c. moisture) . . .	1.00	62.5
Equivalent dry weight	0.45	28.2
Gross weight (42 per cent moisture) .	1.20	75.0
Equivalent dry weight	0.695	43.5

Table C. gives some experimental baling with Hedy-chium where the density is expressed in grms. per cc. and lbs. per cubic foot. This gives one some idea of the amount of diminution of volume during the process of baling. In practice the reduction in volume is considerable, one ton dry weight uncompressed occupying over 400 cubic feet, after compression less than 40, that is it reduces to about one-tenth. A continuous baling press, by producing bales of a density of 25-30 lbs. to the cubic foot, is well adapted to this work as a first operation. The next operation is best done by compressing two bales into one to a density of 60 lbs. to the cubic foot prior to shipment. The laboratory results obtained with elder presses in light compressions seem to indicate that greater dry weight per cubic foot can be obtained if the material is compressed in a moist rather than a dry condition. This is due to the material becoming more yielding to the pressure when moist than when dry, but when heavier pressures are employed the moisture taken up by the fibre causes it to swell somewhat and to offer a barrier to anything like complete compression, so that the reverse is the case, namely, for high densities the dry goes closer than the moist. Thus 77 lbs. per cubic foot, before releasing from the presses, has been actually obtained in making dry compressions; this expands to 62 lbs. to the cubic foot when the pressure is released, but when the moist material, containing about its own weight of water, is similarly treated in iron cylinders, the density under full compression is 66 and when released 44 dry lbs. per cubic foot. The same is to be noticed when baling under hydraulic pressure recorded in Table B. In the case of the hydraulic pressed bales we obtained 66.0 dry lbs. from the dry pressing and 66.8 moist lbs. per cubic foot from the moist materials after release from pressure. Unfortunately we did not take note at the time of the dry weight in the wet baling, but we have since dried out the bale and find that it had a density of 38 dry lbs per cubic foot under equal pressure with the former.

The conclusion is, therefore, that for moderate pressures and density, a greater dry weight per cubic foot is to be obtained baling moist than when baling dry, but that with hydraulic pressure for high densities, i.e., in the neighborhood of dead weight, the greater dry density is obtained by baling air dry or in the neighborhood of air dryness.

SWEDISH WOOD PULP TRADE.

Before the outbreak of war "Åftarsvarlden," the trade journal of Sweden, had the following to say about the condition of its wood pulp trade:—

Mechanical Pulp.—The heavy drought now begins to make itself very much felt at the wood-pulp mills especially in central Sweden. According to what we have learned, about 10 mills have already nearly stopped work altogether owing to water famine, and an equally large number of mills are for the same reason running with $\frac{1}{2}$ or $\frac{3}{4}$ power.

The state of prices is therefore firm with a rising tendency, but the turn-over is quite significant.

Chemical Pulp.—The sales have been more lively lately, and it is especially the American paper-makers that have been in the market. Quite a large contract in strong sulphite has been closed at a price, corresponding to £7 12s 6d f.o.b. including broker's commission and discount; also for easy-bleaching sulphite a couple of big sales of £8 10s f.o.b. have been closed.

The sulphate market on the contrary has been very quiet during the last weeks with unchanged prices.

FOREST PROTECTION PROPAGANDA.

The Forest Branch, Lands Department, British Columbia, has designed a pocket whetstone with a celluloid back, for distribution among the Boy Scouts of the Pacific Province. On the celluloid appears the legend—

Build Camp Fires in Safe Places
When You Leave, Put Them Out
Boy Scouts, Be Prepared
Help Protect Our Forests

Chief Forester MacMillan writes to the Scout Masters:—

"Altogether 1,000 of these Boy Scout stones are being sent to the Scout Masters of the Province. 10,000 pocket whetstones like these, but bearing a different inscription, and thousands of posters, pictures and circulars have been distributed also by the Forest Branch to the general public.

Our forests form the most valuable resource owned by the Province. They are its greatest single source of revenue—a revenue which helps build our roads, bridges, schools and other public works—a revenue in which every citizen shares. Their conservation is an object well worthy the aid of the Boy Scouts. You may be assured your co-operation will be appreciated."

To Pulp and Paper Magazine, Mr. MacMillan says: "This is part of a systematic campaign for forest fire protection which the Forest Branch is conducting. Altogether over 50,000 circulars, posters, pictures, pocket whetstones, etc., have been distributed all over the Province to lumbermen, woodsmen of all kinds, newspapers, banks, hotels, stores, clergymen, school children, etc. The response has been very gratifying.

"The latest, and I believe, one of the most effective moves in the campaign is to reach the people by means of the moving picture theatres. A number of educational slides have been designed, and will be shown at practically every moving picture theatre in the Province, through co-operation with the proprietors."

SUPERINTENDENT HONORED.

On July 25, a reception was tendered to Mr. W. D. Gregoir, former mill manager of Price Bros. and Co., Ltd., by the employees, in honor of his departure. Mr. and Mrs. Gregoire were the recipients of a beautiful silver tea set, while a handsome travelling bag was the individual gift to Mr. Gregoir.

Superintendent Grieg made the presentation speech, which expressed the regret of the employees of the company at losing a man so fully appreciated by all.

Mr. Gregoir's reply was full of praise and good fellowship for the men who have worked with him during the period of his stay in Kenogami. A buffet lunch and entertainment was enjoyed to the fullest extent by those present.

Gen. Gregoir will make his home in Montreal for the time present.

The Terry Steam Turbine Co., builders of steam turbines for all purposes, main office and works, Hartford, Conn., announce that they have appointed Fidanque and Sons, of New York and Panama, with main office at 15 Whitehall Street, New York, as representatives for the Republic of Panama and the Canal Zone. Also that on August 1 their Cleveland office, in charge of Mr. L. G. Finlay, will be moved from its present location, 710 New England Building, to 503 Union Building.

UNITED STATES NOTES

Mill 5 of the Union Bag and Paper Company's plant has resumed operations at Glen Falls, N.Y., under full head, placing more than twenty-five men to work who have been unemployed for more than three weeks. With the aid of an electric motor, together with the water power realized from the coffer dam recently erected, it was found possible to start up the paper machines immediately. The Fenimore plant of the Union Bag and Paper Company, beginning last week, will be operated on full time. For a number of weeks the mill has closed down Saturday morning, to resume operations Monday.

Increased orders and brighter prospects for business have caused the company to take this step. The dull times for the Union Bag Company are apparently disappearing like dew before the morning sun. The bag and printing departments are being run to capacity.

Application was made in federal court at Fort Wayne, Ind., last week by creditors of the Elkhart Paper Company of Elkhart, for the appointment of a receiver for that concern, which is alleged to be unable to pay its debts. The concern is capitalized at \$300,000, and is said to have assets of \$800,000. An over-expansion of business is said to be the cause of the trouble. Upon instructions from Judge Anderson, Commissioner Logan referred the matter to Judge Sol Wood, referee in bankruptcy. A subsequent meeting was held in Judge Wood's office and Glenn R. Sawyer and A. A. Wheat, both of Elkhart, were named as receivers and they were given authority to continue to operate the plant. The petition was filed by the Central Manufacturing Company of Kalamazoo, the Chicago Fuse Company, American Spiral Pipe Works and others. They allege that the company is in debt in excess of \$300,000 in open accounts and \$250,000 bonded indebtedness. Assets include \$60,000 worth of stock and products.

A new concrete dam, which will be about 300 feet in length and 15 feet in height, increasing the power at the mill of the Taggart Paper Co., at Great Bend, N.Y., will be started within a few days and rushed to completion this season. The plans for the improvement were made by J. M. Baldwin, the engineer for the St. Regis and Taggart's paper companies, and the contract has been awarded to the Stewart Engineering and Construction Co., of New York, which constructed a large dam for the St. Regis Paper Co. about a year ago. The new dam will cost several thousand dollars, and will be of a distinctly modern type. Under the contract it will be completed in five weeks, making it necessary to close the mill only for that length of time. The mill was shut down last Monday, and no other improvements are now contemplated. The height of the dam will be about one foot more than the present one.

Cape S. Miller, of Holyoke, Mass., for the past three months assistant superintendent of the Albion division of the American Writing Paper Company, and previous to that time superintendent of the mill division of the company, resigned several weeks ago. Mr. Miller suc-

ceeded G. Obermann, who resigned and left later for a trip to Europe. It is understood that Mr. Miller will leave for the West in a short time. A. C. Gault, 38 Taylor street, business manager of the Albion division, will be Mr. Miller's successor. He has been connected with the company for many years and previous to going to the Albion mill he was manager in the general offices of the company in Main street.

By a decision handed down by Judge A. H. Reid of Nausau, Wis., Eau Claire is the loser in the famous Dells dam case brought by the Dells Improvement Company and the Dells Paper and Pulp Company of that city. The litigation, which had been hanging fire in the courts since 1906, involved rights and privileges to the Dells dam, which was built by the city in 1877, and leased to the plaintiffs for ninety-nine years for \$1 a year. The city assailed the contract, contending it invalid and an abuse of discretionary powers of the city. The city also contended that the Dells people had violated certain provisions of the contract.

Charles N. Bulger, of Oswego, N.Y., and David F. Costello, trustees of the Battle Island Paper Company of Fulton; Gay Daley, Chairman of the Bondholders' Protective Committee, and William P. Gannon, attorney, left Syracuse last week for Montreal, where they will confer with the liquidators and inspectors of the bankrupt company's Canadian property. The third trustee, Nelson P. Bonney, of Norwich, Conn., probably will join the party later. The conference, which may last for several days, will concern the future of 110,000 acres of timber land in the province of Quebec, which is an important item in the bankrupt's estate. It is understood that the property, which includes a rossing mill, has been appraised at \$385,000.

The International Paper Company of 30 Broad street, N.Y., reports that business is running at about 90 per cent. of its normal rate. This is sufficient to insure the earning of a small margin above the 2 per cent. preferred stock dividends. Last year the company showed 4½ per cent. on its preferred shares, ordinarily the consumption of newsprint increases between 7 per cent. and 8 per cent. annually, but owing to depressed trade conditions at present, the output and consumption this year has failed to maintain its usual gain. This situation, however, has been greatly changed since the increased business during the past two weeks will undoubtedly make a decided improvement in the earnings of the company.

Work is progressing rapidly on the Badger Paper Bag factory, located one block south of the street car barns at Nausau, Wis. The steel frame work is up and the steel cross-beams are being laid. The first story is going up quickly in brick and tile. The two upper stories are also outlined in steel. When this structure is completed it will be the most substantial buildings of the kind in Nausau. The promoters of this establishment are men of wealth and energy and when they take hold of an enterprise it is bound to be a success.

The work of placing the new machinery will begin as soon as the roof is on and by about September 1st the factory will be ready for operation.

Proposed increases in rates on paper of various kinds in less than carload lots from points in New England on the New York, New Haven and Hartford, Boston & Maine, and Boston & Albany roads to New York City and other points were suspended last week by the Interstate Commerce Commission until Nov. 25. On the first two named roads the increase would have become effective July 28, on the Boston & Albany on Aug. 18.

The York Haven Paper Co., of York Haven, Pa., has recently installed a Stanley inductor type 350-k.w. 3 phase 60 cycle generator at 220 volts' pressure. This company's plant is now equipped with 30 motors, all three phase. The largest is 50 h.p. There are about 500 incandescent lamps and 8 General Electric flaming arc lamps for yard lighting.

The Cornell Paper Products Company is the name of a new corporation, capitalized for \$3,500,000, which takes over the holdings of the bankrupt firm, the Brunet Falls Manufacturing Company, of Cornell, Chippewa County, Wis. The property consists mainly of a paper and pulp mill, with extensive water power at Cornell. The plant was erected several years ago. The Ule Construction Company, of Stevens Point, Wis., having done a part of the construction work. The incorporators of the new company are: Rufus B. Smith, N. R. Curkell and R. M. Stroud, all residents of Wisconsin.

The Wolf River Paper Mills at Shawans, Wis., is making improvements all the time and have a very complete plant. They recently installed a five-ton digester, which is double of their other two. They are now making new tanks for the sulphite tower, and also making other improvements. They have a good demand for their product, which is considered among the best made.

The English Fibre Board Company, which recently took over the old Shutt's mills at Penn Yan, N. Y., is now producing high grade board, such as press, leather fender, chair seating, etc. The company bought the old mill and remodeled it complete, equipping it with the best machinery to produce the highest class of press board made, and the product is the highest class of press board made. This mill is equipped according to the English ideas and is operated by English workmen. This, together with the latest style machinery, will enable it to make as good if not better board than produced even in England.

The Western Paper Dealers' Association held a meeting at Grand Pacific Hotel last week. The meeting was held for a special purpose, but beyond this fact and a statement that the purpose of the meeting was accomplished, no information concerning the proceedings could be obtained. As a rule, the Association meets only in the latter part of the year. The calling of the special meeting was not generally known and the paper men came and went without disclosing the nature of the subject which had occasioned the special gathering.

Within a month the J. B. Wise power plant at Watertown, N.Y., will be finished opening up what is said to be the largest plant of its kind east of the Mississippi

River. The building will be of concrete, 162 by 40 feet, with a height of ninety feet from the bottom of the draught tubes to the top of the roof. Six draught tubes will open into the head of the river from the base of the building. These tubes are horizontal and designed to obtain the maximum efficiency. The power will be developed through generators 19 feet in diameter. Each generator together with its water wheel will weigh 100 tons. The dam at this point is 210 feet wide. Of the 3,000 horse power developed, 600 h.p. will be used at the J. B. Wise plant and the rest will probably be distributed to the other enterprises in the section.

The war in Europe will in all probability have a decided effect upon the China Clay situation in this country, but what it will be remains to be seen at present. Importations at Portland, Boston and New York will be decidedly curtailed for some time to come, and supplies on hand at present are reported to be comparatively light. The leading importers in these cities have had innumerable requests of late for additional supplies, and many say they will only be too willing to construct additional bins or pay extra storage if they can only secure sufficient quantities to tide them over for the next six months. Coating paper manufacturers in particular are very anxious, and it is the consensus of opinion that many of them will have to resort to substitutes before long. Hammil and Gillespies, the leading importers in New York, stated to your correspondent last week that they had orders on hand for more China Clay than they could fill, and that shipments on the way to them at present were comparatively light. This certainly indicates that the market for this item will be very strong so long as the war in Europe prevails. As far as prices are concerned, though, no advance has as yet been reported and it is quite evident that the commodity will rule at very high levels.

Advices from Maine state that Austria, Serbia and Russia may draw upon workmen in this country to participate in the war abroad. If such is the case the paper mills in Maine would be seriously effected, as quite a few of the foreigners are employed in the forests in that State. Already quite a number of the foreigners have left their positions and made for the nearest seaport in the hope of booking for their respective countries. As far as drafting is concerned, however, it is not likely that Uncle Sam will permit any aliens to leave this country without their consent.

On August 1 in the United States District Court at Dayton, Ohio, was filed an answer to the petition in bankruptcy instituted by Jacob Hyman and others, denying the insolvency and acts of bankruptcy charged against the Sterling Paper Company of Hamilton. District Attorney L. W. James, of Hamilton, represented the purchasers of the plant (C. F. Berdy and Alfred A. Sere). It is admitted that payments were made to the Anderson & Shafer Company on March 14 and May 29, 1914, respectively, but that they were made with intent to prefer this company as a creditor, or that the Sterling Paper Company was insolvent at the time, is denied. The court is requested to inquire into the matter.

The assets of the company are estimated at \$300,000 and the liabilities at \$200,000. The president of the Sterling Company is J. Howard Friend, for many years the head of the Friend Paper Company, at West Carrollton, but who, since the reorganization of that concern, has been located in Dayton, where the offices of the Sterling Paper Company are located. The plant

is located in Hamilton and is one of the best equipped of its kind in the country. While heavy losses were sustained during the 1913 flood, and it was necessary to go over much of the improvement work which was in progress in the mill at the time, it appeared to be weathering the storm in good shape. The depression in trade had its effect, however, on the company, but, according to its allegations, it is far from insolvent, the assets being approximately \$100,000 in excess of the reported liabilities.

Plans have been practically completed for the reorganization of the Sterling Paper Company. The formal reorganization will probably occur during the week when a meeting of the new owners will take place. It is planned to issue new stock, but in just what amount has not been definitely decided.

An least \$100,000 will be expended in installing new machinery and in the erection of new buildings. When completed, the plant will be one of the largest and one of the best equipped in the State. It is proposed to incorporate the company under the name of the Hamilton Paper Mills Company, so it is stated.

Dispatches from Philadelphia tell of a dearth of raw materials for paper making uses, and one of the leading trade journals state that while war has not so far directly affected the trade, Philadelphia paper makers believe it will not be long before prices must go up as a direct result of the restricted supply of those essentials which come from abroad. They take the view that paper makers are always the very last to advance prices, but that the necessities of the present case soon will make it impossible for them to continue at present rates.

Vast quantities of sulphite are imported from Germany, and this supply will of course be shut off. Large supplies of cheap rags also are imported from Germany and Italy, and if this is cut off recourse will have to be taken to domestic stock, with a consequent increase of price through competition for a supply not adequate to demands. Finally and most important of all, there is now shipped from Fowey, in the west of England, Cornwall clay used in making supercoated and calendered paper, and since there is said not to be in this country a clay supply which will replace the foreign, the makers of the higher grades of paper fear a restricted if not an entirely suspended supply. From Germany and elsewhere abroad are now received various other raw materials, chemicals and other dyestuffs, but the restriction of these is not looked upon as very important. The net result, however, they say, will be curtailed supply and advanced prices.

The first crew to engage in lumbering in the Maine woods for the season of 1914-1915 left Bangor last week for Phillips, where operations will be carried on by F. J. Bangor, the largest individual timberland owner in New England. From now on crews will be sent to the woods at varying intervals until next March. Before the days of railroads into the heart of the forests, it was unheard of to see crews starting out before snow fall, but with the advance of civilization and the constant supply of pulpwood, especially now at this critical period, it has been found necessary to make earlier starts.

In speaking of the effects the war in Europe will have upon the wire cloth manufacturers in this country, an authority this week stated that it's an old wind that blows nobody good. That maxim is applicable

in the case of the American wire cloth manufacturers, especially those in the Middle West, when thought turns to the European situation. Ever since the new tariff law became effective, western wire cloth men have suffered a decline in business as a result of the invasion of German-made wires. The present situation in Europe generally will at least result in the temporary interruption of shipping of German wires into this country. Uncle Sam's paper mills will keep on grinding away and will have to use wires, but they won't be foreign made. Western wire works have been running on a 50 per cent. basis for months. It is probable the present situation will make it possible to resume the former 'rush' conditions.

Workmen have practically cleared away all of the debris where the plant of the Niles Board and Paper Company stood, at Niles, Mich. The fire made a clean sweep of the whole building, leaving practically nothing that can ever be used again. There are many thousand pounds of junk and rubbish to be disposed of, and officials of the company are now planning the construction of a new mill on the site of the one recently burned.

Arthur C. Hastings, the newly appointed President of the American Writing Paper Co., this week signed a lease for a number of years on the C. B. Prescott house on Linden street, in Holyoke. Since his appointment to the presidency of the A. W. P. Co., Mr. Hastings, who has heretofore maintained his residence in New York City, has been undecided as to whether he would take his family to Springfield or Holyoke. Advantages of the latter city caused him to secure the above place.

EMPLOYMENT OF PYRITES INSTEAD OF SULPHUR IN CHEMICAL-PULP MILLS.

Almost all large European chemical-pulp mills have changed over from burning sulphur to roasting pyrites; mills in America and Canada for the most part still use sulphur. When pyrites is employed a saving of 11.35 dollars per 1,000 kg. sulphur is obtained. Pyrites having only 45 per cent. sulphur cannot be rationally roasted at once, because the percentage of iron suffices for using it further in blast furnaces. Pyrites having only 35 per cent. sulphur cannot be rationally worked up on account of its small percentage of iron. If the purple ore contains copper, however, pyrites having 35 per cent sulphur can also be advantageously employed.

According to a new process by Buddens a percentage of 0.8-1 per cent copper in the purple ore suffices for enabling this to be rationally worked up further on the spot into copper and then into iron. According to this process the calcined pyrites are chlorinized with compressed air, without employing carbon, solely with the small percentage of sulphur amounting to 2 per cent and roasted, and then all the copper with the exception of 1 per cent is recovered from the purple ore. The process is also suitable for small quantities of ordered ore, e.g. about 20 t. per day. The Buddens bath is made entirely of cast-iron and is ready for working in 10 minutes, it can therefore be worked intermittently. The cost of working up 1 ton of purple ore is about 2.0-2.5 dollars including amortisation, lixiviation and recovering the copper. Any silver contained in the purple ore is recovered with the copper. Several large chemical pulp mills in Europe work on the Buddens process. Der Papier Fabrikant.

Ottawa Notes

Ottawa, Ont., August 10. The cut of timber and of pulpwood in the Ottawa Valley next season will be considerably decreased as a result of the war. The advance in the price of food and the increased cost of horses will be largely responsible for this. The J. R. Booth Company had figured on sending about 4,000 men to the woods this year, but as a result of the outbreak of hostilities and its expected effect on prices will send in only about 1,000. Other companies state they will follow suit in this regard so that next year's cut will probably fall far short of previous figures. For various reasons, too, the cut of the present season will be smaller than expected. The J. R. Booth Company was tied up for over a month as a result of the breaking of a flume wall, and the Shepard and Morse Lumber Company has had its plant disorganized as the result of an accident to the machinery last week. Then the Gilmour and Hughson Company of Hull over a week ago lost \$200,000 worth of lumber in its yards as the result of an outbreak of fire. Much of this was pulpwood, the company states, mostly spruce logs.

When to these factors is added the record low level of the Ottawa river it will be seen that the present supply of pulpwood in the Ottawa Valley will not by any means be large. However, it will probably be large enough to meet the demands for the raw material since the war situation, while it will boost the demand for news print, is expected to injuriously affect other branches of the paper trade. That, at least is the opinion of Ottawa Valley mill owners. Up to the declaration of war the paper business locally had been showing improvement. In a statement issued last week Mr. W. H. Rowley, general manager of the E. B. Eddy Company of Hull had stated that there was an increased demand for wrapping paper and paper bags, in spite of alleged trade slackening, and the company's mills had been running continuously at full time. Now, however, this is expected to fall off though, as already stated, the number of newspaper extra editions being issued all over Canada will call for a larger production of news print.

The paper mills of the J. R. Booth Company, which were put out of operation as the result of the breaking of a flume wall at the plant over a month ago, commenced operating once more within the past two weeks, and the two pulp mills which also had to be closed down, are now making up for lost time. Within another month the new addition to the present sulphite mill which has been in course of erection for some time, will be ready for operation. It will add fifty tons to the present capacity of the plant.

The much dreaded forest fire which has been smoldering throughout New Ontario, has at last broken out in many parts of the North Country, and is dangerous, according to a statement made to your correspondent by Mr. Martin Childerhouse, editor of the "Grand Nugget." Already many square miles of the best timber and pulpwood, of which there is so much in Northern Ontario, have been burned down. The big lumber mill at Earleton, Ont., was destroyed last week with 200,000 feet of sawn lumber and a quantity of logs, which were designed for pulpwood, all of which timber was owned by Mr. W. J. Booth. According to late advices, South Porcupine was in danger of being wiped out, while the buildings of a number of mines have been destroyed. The fires are not entirely unwelcome to the settlers as they are a ready agent for clearing his

land, but they are viewed with alarm by the timber owner, not only for the damage they do to mills and cut timber, but to the productive areas of forest land which they render barren.

The big Temiskaming dam which gave way about two months ago, and allowed a huge volume of water to sweep down the Ottawa River, has been repaired again and is doing its work of conservation. In spite of this, however, the water in the Ottawa River as well as in the Gatineau, is of record lowness, and is dropping steadily all the time. It is feared that power users at the Chaudiere will have to curtail their requirements this fall.

The E. B. Eddy Company has set a patriotic example to other pulp and paper firms by instituting a war fund similar to that raised by the same company during the South African War. According to Mr. W. H. Rowley, general manager, the fund will be raised by means of a special tax on the sulphur and the matches which the firm manufactures. Besides this, the firm has notified all of its employees that any who may wish to volunteer for active service with the Canadian contingent will have their positions kept open for them until they return. The company will also endeavor to alleviate the sufferings of those who are wounded, when they return from the front.

MAC.

The Proper Storing of Paper

By WILLIAM T. REID.

Written Specially for Pulp and Paper Magazine.

In these days of "Express" and "Rush" orders comparatively little consideration is given by the Paper Dealer to a matter that should be an important feature of his business, viz.: The proper storing of paper. At first sight this commonplace essential seems to be of such trivial account that it gets but little attention from the busy warehouseman, who in many cases is sorely tried to find space in his shelves for the ever-increasing variety of new papers being pushed on the market.

The following notes of advice—if they can be so termed—contained in this short article, are by no means intended for the instruction of the paper mills superintendent or his storeman, but rather for the guidance of the paper-dealer and his young assistants on the flats. The storing of paper at the mills is carried out under scientific principles and well thought out methods.

On the other hand, it may not be taken amiss by the paper mill superintendent to hear a word from the paper dealer's man, who too often receives shipments of immatured paper, particularly cheap bonds, printings and common writings, which has not been "stalked" for any time at all, but cut, counted and wrapped immediately the paper has been finished. Too new papers are a continual source of worry and vexation to the color printer and lithographer, more especially when the printing is done on a rapid running machine. Complaints from the printer on this score invariably reach the ears of the dealer and sometimes in rather forcible language, of which the paper maker's finishing superintendent has not the remotest idea. The management of every paper warehouse has its own ideas and methods of carrying out his special branch of work, while a variety of opinions will have their own special merits. There are, however, certain methods, when properly carried out will help to build up the reputation

and good name of a paper warehouse far beyond the efforts of the most persisting advertising.

To please the printer and receive his trade, papers and boards must be delivered to him in a clean, well wrapped and presentable manner. No more trying or exasperating experience can be given to a printer than to send him, say 20 to 30 sheets of a Superfine Ivory Bristol rolled up as tight as a quarter ream of M. G. Tissue. Papers and boards should be stored in a clean, dry, well lighted, ventilated warehouse and kept as free from dust as possible. Damp floors or walls should be carefully avoided, as the absorption of moisture by engine-sized and ordinary printing papers is rather high. So far as possible, fairly large orders should be delivered to the printer in case lots, as this enables the consumer getting his printed forms all the same shade, texture and finish of paper. Care should be taken by the storeman when putting into stock a case of paper to clear out what remains of a former case and place it on top of the new lot to ensure it being sold out before beginning on the newer stock. In as far as it is possible and practical, warehousemen should be careful to fill their orders from the one making, as a new making invariably differs in some slight degree in texture, shade or finish to a former making.

The question of temperature should be carefully watched more especially in mid-winter. No warehouse carrying stock for printers or lithographers should be allowed to get under 56 deg. and should not exceed 76 deg. Papers and boards get easily chilled in transit from the store to the printing office. Papers thus chilled and rushed into a printer's press room, where the temperature is often as high as 76 deg. to 80 deg., naturally undergo a change; they invariably begin to warp and sometimes cockle. Such papers are then unsuitable for exact register work if printed in the full sheet on rapid printing or lithographing machines. The printer is then apt to blame the paper. He should rather locate the blame with the inconsiderate paper warehouseman who, either from want of thought or over anxiety to rush the order, omitted to instruct the driver to cover up the reams while on his truck or van to the printer.

Colored and tinted papers should be stored away from the immediate rays of the sun, as a bright light will often affect the color, even though the paper is fairly well wrapped, if it lies for any length of time facing the sun. Special care should be taken with piling colored papers in stock to ensure filling of orders from all the one making, this being a comparatively easy task, as many of these papers have the making order number stamped on the reams, thus ensuring the consumer of a supply of all the same shade.

Coated papers require a great deal of care in handling to ensure no loss on them by the dealer. Lapping these papers the long way—half ream within half ream—is an inexpensive and satisfactory way of shipping the lighter weights of Coated Litho. and Coated Book. The heavy weights are more satisfactorily delivered in crates, laid flat and the edges protected by woodboard or straw board from the rope or cord injuring the paper. Coated papers going any distance by rail should invariably be cased and well packed to ensure the printer receiving same in good order, as this particular class of paper is very much inclined to slip and break even in the case.

Slated rules and exact methods, however good or well understood, for the better working of paper warehouses, are after all only of value when reasonably applied in a common-sense way.

Badger Bag and Paper Co.

(Special to Pulp and Paper Magazine.)

Wausau, Wis., August 12.—The Badger Bag and Paper Co. has been organized, as previously published in The Pulp and Paper Magazine, under the laws of the State of Wisconsin, with a paid-up capital of \$250,000.00, to manufacture paper bags, and will be located in this city. The building is now nearing completion, and it is hoped to set up the machinery and start operation by the latter part of September.

The officers of the company are as follows:—W. L. Edmonds, President and General Manager; A. Pareira, Vice-President and Manager of Sales; Walter Alexander, Treasurer; C. C. Yawkey, Secretary. The directors are:—W. L. Edmonds, A. Pareira, Walter Alexander, C. C. Yawkey, Jud. Alexander.

The general offices will be in Chicago, Ill., in charge of Mr. Pareira, with branches throughout the United States. The bag factory will be alongside of the paper mill. Due caution has been taken to have ample storage room and facilities to enable the Company to carry a large stock. Mr. Alexander is also President of the Wausau Paper Mills Co., at Brokaw, Wis. Mr. Yawkey is Vice-President, and Mr. Edmonds Secretary and Manager. Mr. Yawkey is also President of the Marathon Paper Mills, and Mr. Alexander is Vice-President of the same mill. These gentlemen, therefore, are long experienced in the paper line.

A. Pareira, Vice-President and Manager of Sales of the Badger Bag and Paper Co., is thoroughly experienced in this line, having been in the paper and bag business for a number of years, and thoroughly acquainted with the manufacturing and sales end of both wrapping paper and paper bags. The line will embrace all grades of wrapping paper and the company will also manufacture a full and complete line of felt, square, self-standing and satchel bottom grocers bags, millinery bags, nail bags, flour sacks, poultry sacks and all specialties in paper bags required by the trade. Mr. Pareira states that he is equipping a thorough printing plant, and will be in a position to furnish wrapping paper and paper bags printed or plain. From present indication the sample products will be ready to present to the trade about the first of October.

YIELD OF HEDYCHUM CORONARIUM

A great deal of interest has been aroused by statements made by Clayton Beadle and Henry P. Stevens in their various papers on the subject of *Hedychium Coronarium*. The high yield per acre has been confirmed by Government Departments in South America. They have taken upon themselves to study the question and to ascertain whether these high yields are available. The information comes from British sources through no less a personage than the Director of the Science and Agricultural Department, Georgetown, British Guiana. As the result of extensive trials and measurements, an official statement has been made that, even in dry land, a five months' crop has yielded 28 tons of green plant per acre and that the height of the plant is from 2 ft. 6 in. to 3 ft. On certain kinds of moist land the plant is found to grow with great vigour, the stems attaining a height of 6 ft. 6 in. The yield of plants of this height Messrs. Beadle and Stevens have already ascertained to be upward of 60 tons green weight per acre. It would therefore appear that the official tests more than confirm the statements already made by Messrs. Beadle and Stevens in regard to the yield per acre.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

English experts are at all times very keen on new sources for producing paper-making materials, and in this connection credit must also be given to the British paper-makers' engineers for the valuable help they give in the way of machinery and advice. The ordinary common Nettle—a plant well-known to every British school-boy for its sting—which grows in barren places and on neglected land to a height of 3 feet to 5 feet, has recently engaged the attention of experts in paper-making materials and the results have been so satisfactory that a new company is to be formed for cultivating the nettle and utilizing the fibre for various commercial purposes. Discoveries recently made show that the time will not be far distant when the Nettle will be used in the manufacture of paper. It possesses a fibre equal and better in many respects to that of Ramie, but the difficulty in the past that had to be contended with was that of degumming the fibre without injuring its tensile strength. Now this trouble has been mastered and recent experiments have shown that the Nettle contains 40 per cent of paper-making fibre. Naturally this discovery has caused a good deal of interest to be taken in the Nettle and the progress of the work to be undertaken by the newly formed company will be keenly followed by the British mill owners.

Sometime ago reference was made in the Pulp and Paper Magazine to the discovery that veldt grass found in South Africa could be utilized for paper-making. The chairman of the Industries Committee of the Pretoria Transvaal Civic Association states that bales of ordinary veldt grass were sent to Scotland and America for experimental purposes, and the reports that had reached him say that the grass is nearly equal to Esparto. It is also stated that a capital of \$96,000 would be required to run a mill capable of producing a minimum of 15 tons of packing and coarse brown paper per week. The starting of a mill is now being advocated in Pretoria and two necessary commodities, lime and coal, are abundant in the immediate vicinity at remarkably low rates. Many paper men in Canada will be interested in the veldt grass, as esparto papers in the Dominion are mostly imported from Scotland. Esparto at the present moment is very dear, for not only prompt but distant shipments, and if veldt grass is found suitable as a substitute, the paper-making industry in Scotland will be greatly relieved.

The Ramsbottom Paper Mill Co., in Lancashire, is again paying an interim dividend on the ordinary shares of 15 per cent. For each of the last three years the return was 20 per cent, and it is perhaps not too much to expect that the rate will be repeated for the current year, although papermaking in England has not been as profitable in England as it was some years ago. This company has a considerable income from investments in the Kellner Partington Paper Pulp Co., which some months ago were valued at £170,437. The Kellner-Partington Company has paid 20 per cent for each of the last nine full years and its interim dividend in May last was at the same rate. It is not unlikely, therefore, that the Ramsbottom Paper Mill Co. will again be in a strong position when its accounts for the

year are made up. The North of Ireland Paper Mill Co., Ltd., which has recently introduced electricity for power and lighting at the Ballyclare mill, near Belfast, in the half-year report ended 30th June, state that considering the difficulties experienced in the past respecting the water supply and the present condition of trade, it is to the interest of the shareholders that no dividend be paid for this half-year. The profit from working accounts for the six months, amounts to £1,413, and the profit and loss account stands at £43,219. Brown, Stewart, and Co., of Glasgow, a firm established in 1892, having a capital of £100,000, report that net profits are little more than half those of last year at £4,857, but the directors are enabled to pay a full year's dividend, even on the preference shares. The balance-sheet is not strong.

The four ordinary general meeting of the shareholders of John Allen & Sons, Ltd., Ivybridge Paper Mill, was held the other day in London and the directors reported: "After providing for the debenture interest, trustees fees, the interim dividend paid in December last on the preference shares and managing directors' commission, there remains a balance of £2,398 7s 1d. Out of this sum the directors recommend a further dividend of 3½ per cent on the preference shares, making 7½ per cent for the year, a dividend of 6s 7d be placed to reserve against stock, carrying forward the balance of £300 6s 7d." Walter H. J. Smeed, presided at the meeting, and amongst the shareholders was F. E. R. Becker of Becker and Co., Ltd., pulp importers. Mr. Smeed, in moving the adoption of the report presented by the directors, said he had much pleasure in stating that even with the depression in the paper trade during the year, the sales of their company showed an increase of about £6,000 more than the previous year and that year was the best the company had experienced. That showed their papers were regarded favorably, as they had had no lack of orders and had secured besides some very good contracts. But whilst they had been fortunate in this respect, the trading account in common with all other paper mills had been seriously affected by advances in prices of nearly everything the company used, and although they had succeeded in obtaining in some cases increased prices for their paper, they had not been recouped for the extra cost of production. Mr. Smeed went on to speak of the great economy the directors were exercising in the mill, and he also dealt with the installation of new machinery and engines to decrease the cost of production. Speaking of the recent fire at the mill, he said that the directors after settling things with the insurance company were able to show in the balance sheet the very substantial sum of £22,000, as a reserve against the plant, machinery and property. The report was considered satisfactory and the shareholders voted the two directors of the company the sum of £200 10s for their services.

Most of the paper mills in England and Scotland are at present giving all the mill hands a day's excursion at the seaside, or some favorite resort not far distant from the mill. As an instance of what these excursions are

like, Edward Lloyd, Ltd., took 2,000 workers and their friends to Margate from the Sittingbourne mill in a specially chartered train. The party spent the day at the sea-side and all the arrangements were left in the hands of a committee selected from the workers. Similar excursions are taken by other mills and the trips naturally help to cement a better feeling between the mill owners and their workers.

The steamer "Norway," which trades between Christiania and England was stranded the other morning on a sunken reef off the Haddingtonshire Coast. She had a cargo of pulp and paper, in addition to a few passengers, and the crew.

The chief inspector of mills and factories in England and Wales has issued his annual report, and he draws attention to the violent explosion that paper dust causes when allowed to assemble in a closed chamber, and ignited by a naked light. He says that paper dust is very inflammable to a high degree—a degree of inflammability which is practically the same as that of very finely powdered Lievin coal containing 30 per cent of volatile matter. The inspector adds that in consequence of a serious paper dust explosion in a mill in France, he has issued instructions in England to have all faulty conditions remedied, where dust is allowed to accumulate. He has also a word to say on floors in paper mills. The proper laying and draining of floors, he says, does not receive the attention of architects and builders of mills that it should. A good concrete floor, properly laid, with sufficient fall to suitable channels, will stand for years where no acid is used; but one frequently finds a floor consisting of a few inches of concrete overlaid with a thin coating of cement and with no fall or channelling leading to the drain. In a short time such floors become pitted and hollow, and the water is retained. The quality of the flooring must always have an important bearing on this question in all mills. It can only be false economy to provide a floor in a mill which after a short period wears into holes and depressions. These wet floors are conducive to bad health amongst the workers, as well as being dangerous in the progress of mill work.

There is a strike at the Gray Valley Paper Mill in Kent and the terms demanded are a minimum of \$6 a week for the laborer and \$3.60 for the women workers. The owner of the mill says that the trade union that called the strike wants the mill turned into a "union mill" and while he is not prepared to do that, he is prepared to raise wages, if necessary. Men belonging to the Amalgamated Society of Paper Mill Workers have not struck work, but only those who belong to the National Union of Paper Mill Workers. The strike has held up a government contract for the India Office and now a "battle royal" is raging between the organizers of the National Union of Paper Mill Workers and the secretary of the other union, because the former gentleman said that the Amalgamated Society of Paper Makers "kept their men in the mill to help the employer to keep the workers down." The unfortunate point about the whole dispute is that the mill seems to have been divided into two trade unions employed, so that those men belong to no trade union. He says if he makes the mill a trade union concern he must throw out the non-unionists, or compel them to join the union against their wishes.

At the time I wrote July 31, the British papermakers are feeling uneasy over the European crisis. If a Eu-

ropean war comes, the pulp supply in England and Scotland will be affected very materially, and trade in the paper industry will be dislocated beyond comprehension. Germany and Austria are large suppliers of pulp to English mills.

FORESTRY IN THE BRITISH EMPIRE.

Sir Herbert Maxwell, chairman, and members of the Forestry Committee of the Anglo-American Exposition, held a conference on forestry at the White City, on July 16th. Papers were read by Sir Wilhelm Schlich (Oxford) on "The General View of the Condition of Forestry in the British Empire"; by Professor Henry (Dublin) on "North American Hardwoods in Great Britain"; by Mr. R. L. Robinson on "The Relation between the Board of Agriculture and Forestry in England"; and by Mr. A. C. Forbes on "Irish Forestry." Members of the conference inspected the forestry section of the exposition.

Sir Wilhelm Schlich said that until comparatively recent times the management of British woodlands was governed by such conditions as the production of timber for the British Navy, shooting, and the amenities of estates. But during the last generation a considerable change has been brought about, and the economic aspect of forestry, stimulated by the requirements of the Indian Empire, has come into the foreground. As early as 1869 it was proposed to introduce systematic management into the Forest of Dean. Crown woodlands, so that they might serve as training ground for foresters, but the proposal fell flat. Now, forty-five years later, the idea was being carried out; but what a difference it would have made if the original proposal by Sir Dietrich Brandis had taken effect. The successful development of the forest administration started in India in 1864, has resulted in similar measures being taken in nearly all British Colonies. India had also had a decided effect upon the modern development of forestry in the United Kingdom. The net revenue of the Indian forests amounted in 1864 to one million rupees, and it had now risen to fourteen million rupees. It might safely be said that the development of systematic economic forest management in British India was something to be proud of. Next to India South Africa had grappled most successfully with the forest question.

Referring to Canada and the enormous loss owing to forest fires and to excessive and wasteful cutting, he said he personally had urged the introduction of regularised systematic treatment of the forests, because they were one of the main sources of supply to the United Kingdom. Fortunately a movement in favor of protecting and husbanding the forests had now received a new impetus. It should not be overlooked that, important as the forests were on account of the produce which they yield, they were even more important on account of the influence upon the preservation and regulation of the water supply of the country and as a barrier against northern air currents.

Concluding with a reference to Great Britain he said there were some fifteen million acres of uncultivated and heath land in these islands used for light grazing, and yielding on an average a shilling an acre each, if so much. Yet it had taken some thirty years of discussion before a step forward towards the granting of part of this had been taken. Of our timber imports, valued in 1912 at £42,000,000, some ninety per cent. were conifers, all of which could be grown in these islands as well as all the timber used in the manufacture of paper pulp.

PULP AND PAPER NEWS

The Dunlop Pulp and Paper Mills, Limited, which were incorporated a few weeks ago with head offices at Selkirk, Man., have had plans drawn for a new pulp and paper mill which will cost about one hundred and fifty thousand dollars. Construction work may be started this fall. Among those interested in the new concern are F. A. Dunlop and T. McHattie, of Winnipeg. The capitalization is \$100,000.

An application has been made to the British Columbia Forest Branch by the B.C. Sulphite Fibre Co., of Howe Sound, to purchase two hundred million feet of hemlock and spruce. The company has an output of about fifty tons per day which is shipped to Japan and the United States.

W. H. Robertson, for many years proprietor and editor of the Morning Times, Peterborough, died on August 2, of paralysis.

A veteran figure in the stationery and paper line passed away in St. Catharines recently when death called B. C. Fairfield, who had been in business in that city for forty-six years. Mr. Fairfield was in his eighty-sixth year. One of his sons, George H. Fairfield, will carry on the business, being associated for a number of years with his father.

The Laberge Lumber Co. have been granted permission to increase their capital stock from one hundred thousand dollars to two hundred thousand dollars, by the creation of one thousand new shares of one hundred dollars each.

The tale industry is growing rapidly in Ontario. In 1899 there were only one hundred tons mined and the value was only \$500. Last year there were 8,238 tons mined of the value of \$74,500. During the last forty years there has been obtained, according to the report of Prof. Millar, 40,213 tons of the value of \$265,577. Almost all of this came from the Henderson talc mine at Madoc in Hastings County. The balance was obtained from deposits at Eldorado and Gananoque. It was not until the fall of 1908 that the material was ground in Ontario. In that year the tale mill began operations at Madoc under the management of George H. Gillespie, and there has been a rapid increase in the production ever since. Three years later a plant for grading tale was erected at Eldorado by the Canadian Talc and Silica Co., Limited. Large quantities of crude tale are now secured near that village.

J. R. McGregor, for many years sales manager for J. C. Wilson, Limited, Montreal, manufacturers of paper bags and wrapping papers, has resigned his position.

It is understood that the George Irish Paper Co., of Buffalo, N.Y., will, in the near future, open a warehouse in Toronto which will be managed by F. A. Crippen, formerly Toronto representative of the Continental Bag and Paper Co. The company will do business in Canada under the name of the Crown Paper Co. It is said that they also intend to open branches in Winnipeg, Montreal and other cities.

G. A. Howell, of the Howell Trading Co., Toronto, and wife, are spending the month of August in Miner's

Bay in Northern Ontario. He will look into the matter of pulp wood supplies, etc., during his absence.

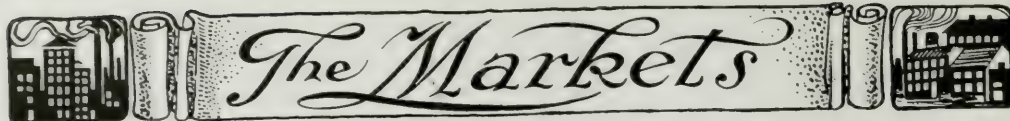
A. M. Huestis, who is the representative of several Old Country and American mills in Toronto, is spending several weeks at Little Metis, Quebec.

The Abitibi Power and Paper Co. of Troquois Falls, Ont., have turned out their first production of ground wood pulp, and everything is now running smoothly. Daily shipments are being made, having started last week. The company report that a number of favorable contracts have been entered into and that the market prospects are good. Samples of the pulp received in Toronto and Montreal have been pronounced first-class and the plant is now running to eighty per cent capacity.

The Dominion Board of Railway Commissioners report that the railways are doing much better in the matter of fire protection this year than ever before, and are complying closer with the requirements of the board. The companies are co-operating heartily with the various agencies interested in the prevention of forest fires and working in harmony with the organizations of the federal and provincial governments. The situation has also been greatly improved by the increase in the number and strength of the lumbermen's and pulpwood owners' co-operative fire protection associations, of which there are now two in the province of Quebec, guarding a total of nearly fourteen million acres of limits.

Fine progress is being made on the various sections of the new fifty million dollars well and ship canal. The total length of this new waterway from Port Wellar on Lake Ontario to Port Colborne on Lake Erie will be twenty five miles and it will have only seven locks. The locks will be eighty feet wide with a depth of thirty feet of water and capable of accommodating boats up to eight hundred feet in length. The mechanism operating the equipment will allow the locks to be filled in the short time of eight minutes. At Port Wellar the entrance piers are placed about a mile and a half from shore, where the total depth of the water is thirty feet.

Once more bush fires are raging over the country north of Cobalt, and several towns have had great difficulty in fighting off the flames, which have become threatening. Considerable standing timber and pulp wood have been destroyed, and settlers have lost their buildings and entire crops in many instances. Haileybury, New Liskeard, Englehart, Timmins and Porcupine and other places are in the path of the flames and the fire brigades have been busy fighting the element. The village of Buignes, which is located on the Quebec side of Lake Temiskaming across from Haileybury has been wiped out. A bad blaze is also reported from North Temiskaming where the Government is building a big dam. Unless rain comes soon in large quantities, there is every danger that the ravages of the flames will be extensive, and the situation become very serious.



The Markets

CANADIAN MARKETS.

The general paper and pulp conditions in Canada, owing to the European war, are in a state of uncertainty and what quotations may reach depends upon the nature of the struggle and whether Great Britain is able to keep her trade routes open. Conjectures of all kinds are heard and many opinions are offered. Prices in several branches of the trade are already stiffening, and quotations may go much higher. The circulation of some daily papers has increased fully a hundred per cent since the outbreak of hostilities and, should developments from the war zone come fast and thick, this state of affairs may keep up. Mills are receiving inquiries from almost every country asking for prices and deliveries on news print, but it is not likely that the export business will be increased very much, as all the plants have contracts covering the majority of their output for many months to come and will protect their regular customers first. Several exporting mills have withdrawn quotations on news print and will not undertake to supply any foreign demand except to the United States, owing to the disturbed aspect of affairs. It is reported that some of the wrapping paper mills will turn their machines over to news print and in a measure meet the augmented demand, as the market for Manillas, fibres and other lines has been dull for a long while.

Book and writing operators think that hostilities, if prolonged, will benefit them considerably, as several special lines, which some mills have been making to take the place of cheap book papers, will be discontinued and the book plants will have increased requisitions from numerous concerns. Jobbing houses handling special English papers such as grease-proof, parchments, esparto, ledger, sulphite and other products, believe that it may bother them considerably to secure fresh supplies, and stocks at present are low. A large quantity of mill board, straw board, chip board, etc., is also shipped to Great Britain, and the foreign demand is likely to fall off.

American mills, who buy ground wood, and chemical pulp from Canada, are making all sorts of inquiries regarding prices and deliveries and, in view of the anticipated shortage from European countries, hope, in a measure, to make up the deficiency from Canada. It is doubtful if they will find much relief from the Dominion, as if all the mills sold their surplus stocks and ran to their utmost capacity, they could ship more than ten to twenty per cent additional to what they are now doing. Some manufacturers of ground wood and sulphite have already put up the price from two to four dollars per ton delivered, and others have practically withdrawn quotations.

Factors of rag and paper stock anticipate that there will be great activity in their line, and dealers are carrying the country for supplies. It is as yet too early in the struggle to prophesy what bought prices may reach in any branch of pulp and paper, but the whole complexion of the trade is likely to undergo a radical change. In the meantime news print and chemical

pulp are in the greatest requisition, and if trade routes are maintained between Great Britain and Canada, conditions in all other lines may not be altered for some time.

As already pointed out, much depends on what foreign shipments of pulp and special kinds of paper can be imported, but one thing is certain and that is, no permanent good is likely to result to the trade generally from the war demand as, after the strife is over, there would be a demoralizing effect, and matters would be so upset as to work untold damage. The lull would more than offset any temporary advantages in price raising. The industry is such that its best and greatest good is served by steady expansion and solid foundation, rather than by abnormal demand and famine figures.

One leading manufacturer stated that all Canadian news and pulp mills would first of all safeguard the interests of those who have contracts and would in no way jeopardize their relations with such firms to secure higher figures elsewhere. Most of the publishers in New Zealand, Australia and South America had been getting their supplies from Norway, Sweden and Germany, and they would now seek to obtain them in the West, principally from British Columbia. One leading sulphite firm in Canada received an inquiry from the United States last week, asking that 1,000 tons be shipped in two weeks' time. Scores of other messages have been received, but as stocks are low and nearly all the output covered by contracts, peremptory orders have to be declined.

Quotations f.o.b. Toronto are

Paper.

News (rolls), \$1.90 to \$2 at mill, in carload lots.
 News (sheet), \$2.00 to \$2.20 at mill in carload lots.
 News (sheet), \$2.20 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7½c.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.25 to \$2.75.
 Fibre, \$3.00 to \$3.75.
 Manila, B., \$2.50 to \$3.00.
 Manila, No. 2, \$2.75 to \$3.25.
 Manila, No. 1, \$3.25 to \$4.00.
 Unglazed Kraft, \$3.75 to \$4.50.
 Glazed Kraft, \$4.00 to \$4.75.

Pulp.

Ground wood (at mill), \$16.
 Ground wood, \$22 to \$24, delivered.
 Sulphite (bleached), \$43 to \$44, delivered in Canada.
 Sulphite (unbleached), \$44 to \$45, delivered in United States.
 Sulphite (bleached), \$56 to \$57.
 Sulphite (bleached), \$57 to \$58, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.80 to \$1.85, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 45c.
 White blanks, 80c to 82½c.
 Heavy ledger stock, \$1.40 to \$1.45.
 Ordinary ledger stock, \$1.10.
 No. 2 book stock, 45c to 50c.
 No. 1 book stock, 70c.
 No. 1 Manilla envelope cuttings, \$1.10 to \$1.15.
 No. 1 print Manillas, 60c.
 Folded news, 35c.
 Over issues, 45c.
 No. 1 clean mixed paper, 25c to 27½c.
 Old white cotton, \$2.50 to \$2.75.
 Thirds and blues, \$1.20 to \$1.25.
 No. 1 white shirt cuttings, \$5.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$4.75.
 Ordinary satinets, 75c to 77½c.
 Flock, 85c to 87½c.
 Tailor Rags, 65c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 61½c to 81½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 to 25 per cent below the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

UNITED STATES MARKETS.

(Special to Pulp and Paper Magazine)

New York, August 12.

The situation of chemical pulps at present is decidedly grave in this city. Hostilities abroad have caused a complete tie-up of business, and the outlook is that buying will be at a standstill for some time to come. Pulp consumers who have been holding off for some months past in the hopes of securing better prices, made frequent inquiries in the local market during the past week in the hopes of contracting for supplies to carry them over for the next year. Importers, however, could do nothing, and had to turn down order after order for certain grades of Scandinavian and German pulps. As a matter of fact the market is completely demoralized, and manufacturers of paper appear doubtful as to the future. The only hope now is that Canada can be in a position to furnish sufficient supplies for herself and this country as well. Several ships managed to reach this port, and also Boston, during the past week, with a fair quantity of unbleached sulphite, but in each case it was all contracted for. Were the importers able to divert the shipments, they would have been able to secure much higher prices. As far as quotations are concerned, everything is absolutely nominal on European brands; and Canadian brands are already beginning to benefit by the scarcity of arrivals. One large consumer came into the market last Tuesday seeking one thousand tons of No. 1 unbleached sulphite and offered a price that was greatly in advance of what he would have paid ten days before. He, however, had to withdraw his offer as he could find no one at the time to be in a position to fill it.

While ground wood pulp is not in such bad shape as chemical the situation here is also very grave. The greatly increased consumption of news print paper during the past two or three weeks has caused mills to run at the capacity, and in consequence use up much more ground wood pulp than they are generally accustomed to at this period of the year. As a matter of fact available supplies are not over plentiful, and it is the consensus of opinion that if the present situation keeps up there will be a very great scarcity of ground wood pulp before many more days. Prices are very firm indeed. Inquiries are numerous, and almost every consumer is anxious to lay in as much ground wood as he possibly can, believing that the coming months will witness such an advance in prices as to make profitable buying almost prohibitive. While the supply for this country comes chiefly from Canada (there being only a very small percentage imported from Europe) the increased demand for news-print is reflecting an equally increased demand for this item. What the outcome will be only remains to be seen, but paper manufacturers in this city interviewed by your correspondent, are very dubious as to the future.

The situation of the paper stock market reflects pretty much the same condition as in pulp. Importers of rags and bagging have withdrawn their quotations, and are only filling orders at present from stocks in warehouses. Supplies, however, are limited as importations during the past few months have not been very heavy in volume. Large fine paper manufacturers who use only certain grades of foreign packed rags have been persistent of late in their inquiries, and have offered prices unheard of for many years for early deliveries, without success. Importers say that it is absolutely impossible to secure any sup-

plies, for, as one put it, should we be able to get a ship across the Atlantic, we ourselves would be unable to get sufficient quantities to fill it. Collections abroad are in a very bad shape, and there is very little to be had at any costs. The high insurance and the inability to secure credit, too, has its direct bearing upon the market and importers are now suffering intense quietness.

Pulp.

(Quotations on all European pulps have been withdrawn and available supplies are commanding very high levels. The following ranges are purely nominal and cannot be taken as a criterion of the market.)

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.
Ground Wood, No. 2, \$17.50 to \$20, delivered.
Unbleached Sulphite, dom., 1.90c to 2.00c delivered.
Unbleached Sulphite, impt., 1.82½ to 1.95c., ex dock, New York.
Bleached Sulphite, domestic, 2.75c to 2.90c., delivered.
Bleached Sulphite, impt., 2.55c to 2.65c., ex dock, New York.
Easy Bleaching, imptd., 2.05c to 2.15c, ex. dock, New York.
Unbleached sulphate, imptd., 1.75c to 1.85c ex. dock New York.
Bleached sulphate, imptd., 2.50c to 2.75c, ex. dock, New York.
Kraft Pulp, 1.70c to 1.85c, ex. dock, New York.

Paper.

The situation in the local paper market reflects a very active undertone. Buying is strong in all grades, and prices are not only being firmly maintained, but, in many cases are showing a decidedly upward tendency. Newsprint, in particular is moving in greater volume than has ever been reported in any mid-summer month. The supply on hand at the mills is comparatively light, and it is thought that if the large publishers continue with their many WAR EXTRAS the market will soon be practically exhausted. Mills in all sections are running at top speed, with orders coming in hourly. Present operations, however, cannot be maintained as the raw materials are rapidly being diminished. Two of the largest producers of newsprint in this city were personally called upon by your correspondent this week and they both were of the firm conviction that it would not be long before Canada would have to be drawn upon for about seventy-five per cent of the newsprint used in this country. One of the manufacturers produced his records, which showed that his sales August 1 were fifty-two and one-half per cent greater than in the two preceding weeks, which, as everyone knows, is considered to be the worst period in the year for newsprint buying. Water conditions are generally low during the last two weeks in July and the manufacturers take advantage of that period to give vacations and close down mills to make needed repairs. Such was not the case this year. Water conditions were fair and manufacturers have shoved operations forward as much as they could. However, the increased operations have not been sufficient to meet the demand and stocks are rapidly becoming lower and lower, and it is the consensus of opinion that this country will soon be in the same condition as is reported in France and England. But newsprint is not the only grade of paper that is meeting with increased demand. Book papers are moving almost as

well, and the supply here of this grade is gradually becoming depleted, with prices firming daily. All grades of wrapping papers, and krafts in particular, which, heretofore have been weak and uninteresting, are now picking up considerably, and reflecting a very strong feeling. Side run news is maintaining its own on a basis of a good movement. Tissues rule very firm, and passing business compares most favorably with any period so far this year. Screenings continue in good inquiry with prices being firmly adhered to. The local board market is reflecting signs of an early advance in prices, as manufacturers say that they have sufficient orders on hand at present to keep their machines running to capacity for the next two months. Anxiety on the part of the general public over friends and relatives in Europe has caused a heavy pressure of business at the local commercial cable and telegraph offices. In consequence the supply of paper consumed in telegraph blanks has been abnormal. One of the leading publishing houses which supply several of the large concerns with millions of blanks daily, has had to increase its force and double the output. This grade of paper is therefore in equally as good demand as newsprint, but the supply is plentiful at present, and no great scarcity is looked for.

While quotations have not changed during the interval, prices in all grades are decidedly strong, and it is the consensus of opinion of the local paper factors that present levels in almost every grade will be changed before the end of the month. However, for the time being current prices follow:—

Paper.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$1.95 to \$2.00 f.o.b.
News, side runs, 1.95c to 2.05c.
News, sheet, \$2.20 to \$2.30 f.o.b. New York.
Book papers, ear lots, M.F.S., \$3.75 to \$3.90 f.o.b.
Writing paper, superfine, 13½c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.
Manila jute, 4½c to 5c, delivered.
Manila, wood, \$2.40 to \$3.00, delivered.
Kraft, No. 1, \$3.50 to \$3.75 f.o.b. New York.
Kraft, No. 2, \$3.00 to \$3.35 f.o.b. New York.
Boxboards, news, \$28 to \$30 per ton, delivered.
Boxboards, straw, \$26 per ton, delivered.
Wood pulp board, \$40 per ton, delivered.
Tissue, white, cylinder, 40c to 42½c f.o.b. New York.
Tissue, fourdrinier, 47½c to 50c f.o.b. New York.
Tissue, jute Manila, 40c to 41½c f.o.b. New York.

THE BRITISH MARKETS.

(Special to Pulp and Paper Magazine.)

London, August 2, 1914.

In the British paper industry business still remains dull. Many of the mills are short of orders, and stocks on hand are gradually getting larger. This time last year mill owners had orders to keep the machinery running for at least two or three months ahead, but that is not the case now, and the depression is not only confined to England and Scotland, but to Scandinavia and Germany. It is not surprising, therefore, that price-cutting has been resorted to in quotations for domestic supplies, not to speak of the export trade. The printing trade is also dull, which makes matters worse for the mills, but newsprint of a cheap and fair grade is finding a good outlet, thanks to the great demand for newspapers. Cheap white printing papers and super-calendered papers are down to rock-bottom prices, and all the wholesale paper men are advising their customers that now is the time to place orders with the mills, as they will receive better attention, owing to the slackness and can be executed on a cheaper basis than would be the case when the winter's trade brightens up the printing industry. Naturally, just now competition is very keen for any new business that is going, and mill owners are crying out against the prices being so low for the finished product, whilst the cost of production is on a higher basis. Wrapping and packing papers are changing hands freely, while good writing paper is in demand on export account. *Esparto* papers keep dull and of course high in prices.

Ground Pulp.

A few contracts for 1915 and 1916 have been settled, but new business for prompt delivery is scarce. From Scandinavia comes the news that water conditions are unfavorable and many of the mills have stopped producing pulp. Stocks at mills are also reported not to be very large. In England stocks are fully replenished by the arrival of shipments against current contracts, so that buyers are taking things easy in view of the dullness that prevails in the paper industry. The European crisis is also causing some uneasiness, and Canadians would be well advised, should war break out, to keep a keen interest in the British market. Prices are now about as follows, c.i.f. British ports:

Pine, 50 per cent moist, prompt, \$9.58 to \$9.60.

Pine, dry (prompt) \$19.20 to \$20.40.

For forward delivery about half a dollar extra is charged.

Sulphite and Sulphate.

The sulphate market is dull and lifeless. Sulphite is finding a good outlet and prices show no change—in fact contracts on a small scale are fixed up on an easier basis. Prompt business is scarce and large shipments are arriving from Scandinavia and Germany, as well as Finland, against running contracts. Reports from Sweden and Norway say that the sulphite market is dull and Americans are testing the feelings of producers. Prices are about as follows, c.i.f. British ports:—

Bleached sulphite (No. 1) \$56.40 to \$58.80.

Sulphite Easy Bleaching (No. 1) \$30.20 to \$31.40.

Unbleached Soda (No. 1) \$36 to \$37.20.

Soda Kraft \$32.70 to \$33.60.

Chemicals.

Owing to depression in the paper industry and the textile industry, chemicals are not in great demand, and

only a small volume of business is passing. Caustic soda is quoted \$48 for 76 per cent and \$48.60 for 77 per cent. Soda crystals are \$12.20 per ton and Salt Cake \$10.20 per ton. Ammonia Alkali, 58 per cent is unchanged at \$19.20, according to package. Alum is \$24.80 per ton and sulphur \$26 per ton.

Esparto.

During the past few weeks the shipments of *Esparto* to England have been frequent, but the market is having many "ups" and "downs," one week the news being favorable and another week depressing. Early shipments at present are dear and scarce, and the business for forward movements is unsatisfactory.

In the rag and waste paper markets business is nearly at a standstill, but prices are unchanged. In foreign centres the prices of rags are on an easier basis for most grades.

Rosin and Loadings.

The rosin market is quiet and featureless, prices being on a lower level for papermakers' spot parcels. China clay is unchanged and 1915 contracts are still being closed at the same prices as those for 1914. Good business offered for 1915 is in some cases acceptance on easier terms, which Canadians might make a note of. Mineral white and other fillings are moving slowly and without change in prices.

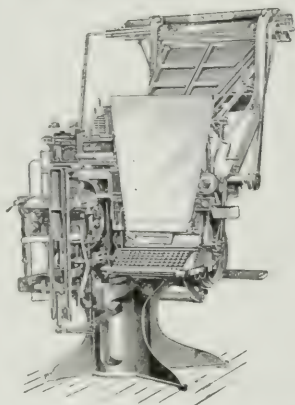
IN DANGER OF FIRE DESTRUCTION.

Northern Ontario has already lost much fine pulpwood this summer through forest fires, but it seems as if the danger of further destruction was imminent. A careful statement of the conditions on some of the limits and over large areas devoted to settlement contains the following: Last year a serious fire destroyed considerable pulpwood along the high ridge that extends for twenty-five miles northwest from Charlton. Much valuable timber remains, but there is little or no settlement on the southwest end shore of the three lakes and even a few parties there are no settlers to fight it. Since that paper is being cut for pulp there are hundreds of acres along the shores worth tens of thousands. There are about thousands of cords of this wood piled and piled. Three dollars per cord is the price paid for poplar at the shore, and from four to four and a half when piled in the saws at Charlton. There is no doubt that hundreds of the forest fires in New Ontario have originated in localities where lumbering has been carried on, as the loggers and tree tops are left to rot and burn when they are left off.

ORGANIZATION OF FOREST PROTECTIVE ASSOCIATION.

The staff of the recently organized Lower Ottawa Forest Protective Association, to which all the lumbering and paper manufacturing in the Ottawa and Maniwagan districts are being well equipped, a manager, three inspectors, and 50 rangers. In order to coordinate the efforts of all the agencies interested in protecting the region from fire, the managers of the association has been appointed an officer of the Forest Protection Association branch of Quebec, as well as of the fire inspection department of the Dominion Railway Commission. To reduce the fire hazard as much as possible, close cooperation with the settlers and with the lumbermen operating in the territory will also be sought. The territory to be covered by the fire rangers will be over 10,000 square miles of timber lands in the watersheds of the Gatineau, Mer, Contrecoeur and North Rivers.

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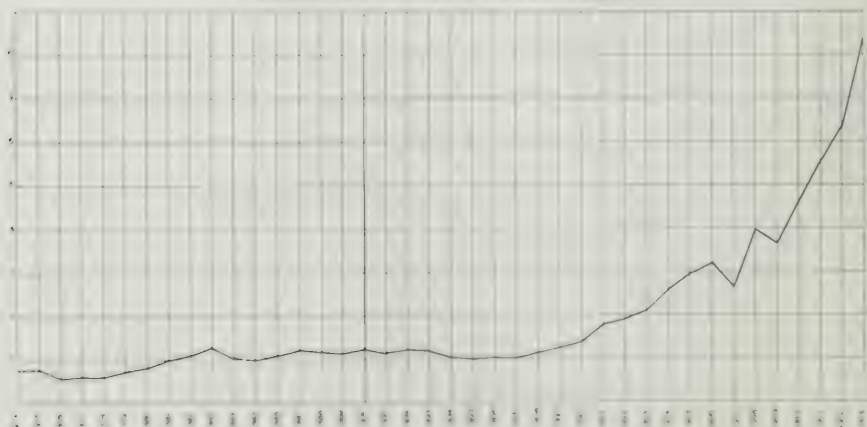
EXTENSIVE PULPWOOD OPERATIONS LIKELY.

Chairman J. L. Englehardt, of the Temiskaming and Northern Ontario Railway, returned from a visit to the northland last week and reported that extensive pulpwood and logging operations would be largely in evidence next season and that a good market and good prices would prevail. A good many settlers, he said, were taking the short-cut to clearing their lands by burning them over instead of cutting down the trees in the regular way.

PRICE ENTERTAINED THE DUKE OF CONNAUGHT.

William Price, of Quebec, the well-known pulp and paper man, had as his guest H. R. H. the Duke of Connaught, on the latter's return from his trip to Newfoundland. Mr. Price took His Royal Highness up the Saguenay to L'Anse St. Jean, which little village was gayly decorated for the occasion, and went out salmon fishing. Two large salmon were killed by the Governor-General.

CANADA'S PULP AND PAPER TRADE.



Imports of Paper and Manufactures thereof in Millions of Dollars, 1874-1913.

Pulp and Paper Magazine

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VOL. XII.

MONTREAL, SEPTEMBER 1, 1914

No. 17

How Long?

The one prayer in the heart of the world to-day is that the war may cease. This struggle is bitter, cruel, destructive and utterly at variance with all that men hold dear in sympathies and ideals. As Canadians, we have rushed to the help of the Allies in order to put down a man whom we would call a tyrant. Now, with devastation and waste of tens of millions of dollars, not to mention priceless lives, bearing upon us, we are bending every energy to the humbling of the Prussian war lord in as short a time as possible. The Anglo-Saxon world considers him a menace to peace and prosperity. Britain unsheathed the sword only to keep faith with the Belgian nation, which was being used as a stepping stone to the ascendancy of Germany.

It now looks as if peace might be reached by Christmas.

The Allies will fight inch by inch the German advance through France, and even should Paris fall, the Russian millions will have occupied Germany. "Hammer and anvil" the situation has been called, and Germany will probably be beaten flat between the two.

* * * *

Whatever the outcome, there will remain a tremendous work of reconstruction. If Germany is beaten her industries will be at a desperately low ebb. Skilled men will have been killed, her manufacturing plants, which are works of marvellous organization and efficiency, will be shattered, and the war indemnity which will be required, will keep the country poor for a generation. Further, for a time at least, the crime of breaking neutrality will not be forgiven by other nations and "Made-in-Germany" goods will have

difficulty in securing an outlet. Perhaps this may be a punishment well worth meting out. It will cost the other nations money, because Germany cannot buy unless she sells, and trade with her must be restricted, but if humbling Germany in the markets of the world will remove the haughty war spirit and tend to kill the operations of the infamous armour trust, Canadians will stand loyally by the policy.

* * * *

During the period of the war there exists, in fact, a wonderful opportunity. Not only in domestic markets, but in the British Colonies and in foreign countries, notably Argentine and Brazil, there are unprecedented demands for our paper products. Large manufacturers are having orders poured in upon them, many of them requesting that the paper be shipped regardless of price or risk. When such conditions as these exist the opportunity of Canadian papermakers is undoubtedly at hand.

* * * *

The first essential step is to get hearty co-operation among manufacturers. A most promising field for work is exhibited in the matter of South American trade. Canadian exporters can easily hold their own in the market, their product is of high quality, the demand large and the conditions of supply the very best. Our paper industry is in the infancy of its development. All that is required is the carrying out of its sales. A little over a year ago, certain firms making other than paper products made inquiry into the matter. Negotiations were carried on between them, the Manufacturers' Association, the Department of Trade and Commerce and the steamship lines involved. The progress of these negotiations is best indicated by

an excerpt from "Industrial Canada" of a few months ago.

Canada should have adequate steamship connections with South America at the earliest possible moment. The recent tour of Mr. Poussette, Canadian Trade Commissioner, through the countries of South America, convinced him that many opportunities await energetic business men. But it will be no use to make goods for the South Americans unless we can get these goods shipped to their ports.

When the Canadian Government entered into a contract with the Royal Mail Steam Packet Company (Pickford and Black, Canadian agents) last year, it was generally understood that a shipping service would be provided, not only to the West Indies, but also to the principal ports of South America. This impression was strengthened by the following clause of the contract between the Government and the company:

"The contractors shall issue through bills of lading from any Canadian point of shipment to any port in Central or South America, which are regular ports of call, for any of the steamships employed or controlled by the contractors on other services and which make regular connections with the service herein contracted for."

So far as South America is concerned, the company have only quoted rates on traffic through to Genoa, La Plata, Colombia and Colon. In reply to enquiries to express doubt that rates can be given to Northern Brazil. Consequently practically all the great South American ports are not connected with Canada on our subsidized service, just at the time when the trade depression is forcing Canadian manufacturers to look abroad for markets."

The need for this steamship service is immensely greater now than a year ago. The market for paper is undoubtedly going to be tremendous, other commodities are seeking outlet, and prominent importers of sales in Montreal say that they would be delighted to see a line of boats running which would carry shipments to them. Hence, through co-operation and active advocacy of their needs it is quite probable that Canadian manufacturers could secure a new and most profitable market.

But the extension of markets is not the only thing to be accomplished. Right within our own borders there are problems of an intensely important nature to be worked out. Education can be affected, efficiency increased and a spirit of advancement maintained by the methods of the Canadian Paper and Pulp Association. There is urgent need of outward, cheerful adaptation, instead of gloomy lines of statistics and market reports.

The outlook for the future is the result of the energy of the industry. Its course may be summed up in condensed "boasting" by all concerned,

Industrial Hysteria

The Journal of Commerce, Montreal, recently published an editorial which has been reprinted in papers from coast to coast. Coming as it does from a financial paper of highest standing this forceful enunciation of principles which should stand foremost in the mind of every Canadian will perform a great service to the nation. Under the caption of "Industrial Hysteria" the Journal of Commerce says:

Canadians are showing symptoms of an acute attack of economic neurasthenia. No one can accuse us of being afraid to fight. Show us a German and we will tackle him, without hesitation. What we are afraid to do is to go on living. Instead of composedly and cheerfully taking up each day a task as the day appears, we are trembling in anticipation of unimaginable hard times and poverty. It is not hard times that we expect, we have them already; it is not simply hard times made harder by war. We could understand that and meet it. It is times so stark and inflexible that iron is in comparison as a sponge and the traditional poker plant as a thread. More prosaically, it is something formless, vast and ghostly, the more dreadful because our reason gives it no shape. If we were all to be doomed to death by slow starvation we should scarcely be more frightened.

We must admit that the war will disturb trade, remove bread-winners from their homes, pile up private and public debts, and generally mitigate the prosperity of the recent past. It is well to be prudent, to eschew luxury, to avoid over-production, and to provide means for helping the specially unfortunate. Having said this we have said it all. The sun will shine, the harvests will ripen, all the staple commodities will have to be produced, and there will be just as much food and money in Canada next February as there was last February.

Fear is one of the greatest forces which operates in the human breast. In its two forms of worry and of terror it shapes much of the course of human conduct. Its chosen agent is the imagination. Its chief activity is crossing bridges before one comes to them.

If anything will precipitate financial disaster it is this mood of dread. President Wilson has vigorously pointed this truth out to our neighbors in the south. Our economic ills, like some of our physical ailments, are born and incubated in our thinking. When householders get panic-stricken and buy flour for the half dozen barrels instead of by the bag the price of flour must go up. The demand exceeds the supply and prices must rise. What seems to be a manifestation of the forethought is only a consequence of the folly. When merchants, manufacturers, loan companies and banks run for shelter the three transforms the wind into a whirlwind. When everyone predicts economic war a false pre-

dence is developed which defeats itself. People seek to save money and get no money to save.

Moreover, the shyster patriot finds his excuse for grinding the faces of the poor. The coal merchant, with his bunkers filled at last year's buying price, hangs a flag out of his upstairs window and adds a dollar to the selling price of each ton. Bread meat, sugar, potatoes—the traffic in none of which has been affected—are racing up the scale. It is to defeat such scurrilous averies, itself terrified yet preying on the terrors of others, that the British Government has taken over the flour mills of Britain.

Let it be repeated that this is a time for economy. It is also a time for heroic effort to keep the business of this country going. It is the time to shorten sail, or run the screw at half speed. It is not a time to put on a life-preserver and take to the rafts. If the industry and commerce of Canada are paralysed this winter it will be because the people of Canada grew hysterical with fear of the unknown and unlikely.

Consider: the dearth is more likely to follow the war than to accompany it. And then it can be more advantageously met, when the stress and frenzy of the fighting is passed. War makes work in many ways. Enormous sums of money are distributed to the producers of many articles. Farmers, manufacturers of boots and clothing, coal miners, and all the middlemen who handle these things will be uncommonly busy. The taking of so many men out of their jobs opens doors to the unemployed. It is when the war is closed and the disbanded troops come home that the trouble is to be expected. The great panic of the Napoleonic period was in 1813, when his power had been broken by the disastrous campaign in Russia. Let us be cheerful yet availing.

King David decreed that those who stayed by the staff should share in the spoil with those who went out to battle. He recognized that there was parity of merit, even though there was diversity. It is as hard to wait and endure as it is to fling one's self into the enemy's trench. We send our contingent across the sea with perfect confidence in its courage. Our brave boys will not disgrace the families they have left behind. They will find the courage they need.

Are we who remain behind finding the courage we need? Perhaps it is a little harder to find. We are not beckoned on by glory, nor keyed to exaltation. There is no pomp nor circumstance in the inglorious drudgery of keeping the national scoop open. But that is the patriotic task of the stay-at-homes. Many a man would be ashamed if his son rifle in hand, failed to stand up against a charge of the foe, yet at the first indication of financial danger he himself deserts the employees who depend on him for work and wages, and runs to save his dollars. Strange that it is so easy to risk one's life so hard to risk one's money.

Let us call things by their true names. It is noth-

ing else than chicken-heartedness which ails many Canadians, more or less prominent in the world of business. They are cowards and they are in danger of bringing us all, themselves included, to needless penury and financial disaster. They are turning back in the day of battle.

Editorial Comment

There has been current in the United States newspapers a report to the effect that the St. Lawrence is being mined by the Canadian Government for the purpose of preventing attacks of German warships. Wherever this report found basis, it is only fair to give it the most emphatic denial. Marine officials in Montreal characterize the story as perfectly foolish, as the effect of such operations would be as bad as to have the river freeze up from the mouth to the great port of Montreal. Nowadays it is most important that the trade route should be kept clear in order that Great Britain may be in constant touch with her source of supplies and benefit by whatever commodities can be received. A Montreal official remarked that if it ever were necessary to mine the St. Lawrence, the work could be effected within half an hour. It is indeed unfortunate that these false stories should have gained ground, as they have doubtless given much anxiety to American importers of pulp wood.

A development in the forestry branch of the British Columbia Forest Branch is the offer of timber on pulp lands amounting in all to over 200,000,000 feet. Since its initiation, the policy of the British Columbia Service has been to secure the best possible sales of timber consistent with a policy of conservation to ensure the maintenance of a timber supply for all times. This offer of nine timber licenses with privilege of thirty years for removal is a step in the right direction in the alienation of timber. It will be viewed with great interest by all pulp manufacturers and conservationists.

FOREST PRODUCTS LABORATORY MOVES.

J. S. Bates, Chief of the Forest Products Laboratory of the Dominion Government has returned from a trip to North Carolina where he was investigating the possibilities of the distillation of British Columbia yellow pine. The result of his investigation will be published in due course. Mr. Bates at the present time is supervising the work of removal of the laboratory from the old medical building of the University to the Molson property on University Street, where such equipment as is ready for installation will be put in. Mr. Bates will be unable to take the trip to Europe which he had proposed, but investigation will go rapidly ahead as far as the equipment will allow.

BLEACHING EFFICIENCY

CONSIDERATIONS IN CONNECTION WITH SUGGESTED STANDARDS FOR BLEACHING QUALITIES OF CHEMICAL WOOD PULP

(BY CLAYTON BEADLE AND HENRY P. STEVENS, M. A., Ph.D.)

Paper read before the London Section of the Society of Chemical Industry, June 8th, 1914.

We have had a good deal of experience in bleaching at different temperatures in paper mills, and one of us devised a circulating bleaching system for rags which was in use for many years, whereby the liquor in course of circulation was continuously drawn from the bottom and sprinkled upon the top of the material. The liquor was maintained at a constant temperature by means of live steam. By studying the temperature and observing the conditions of the bleached material, we came to the conclusion that the result was as good in point of strength of fibre, yield, etc., at 100 deg. F. as at any lower temperature, but that immediately we raised it to say 110 deg. F. or over, we noticed weakening and deterioration of the material, as well as increased consumption of chlorine. We therefore maintained the circulating liquor at 100 deg. F. and the bleaching was done in about one-eighth the time of that required at an ordinary atmospheric temperature. This seems to confirm Messrs. Baker and Jennison's statements for wood pulp.

Then, as regards the use of spent liquors, if liquor is drawn from a material which is in course of bleaching and periodically titrated for chlorine strength, it will be found that the chlorine strength diminishes after the liquor is out of contact with the material to be bleached, and diminishes fairly rapidly.

Another factor in bleaching is the question of agitation, which is a very important one. It is a common practice in some mills to add bleach during the process of beating, especially in rag mills. One of us has made determinations of the rate of exhaustion of bleach during the process of beating and compared the chlorine consumption with that of material bleached, say in the form of half stuff, but without undergoing the beating operation, and discovered that for the same amount of bleaching effect, the material which is undergoing beating consumes only about 40 per cent. of the amount of chlorine as compared with that in the form of half stuff which is not being circulated or beaten.* With electrolytic bleaching for linen half stuff a saving of 30 per cent. was effected, and for cotton half stuff, 47 per cent., by circulating in comparison with non-circulating of liquor. No doubt the circulation and the rapid agitation in contact with air, and possibly with the assistance of carbonic acid of the air, enormously accelerates the action, as well as making it more economical. Although concentration is a very important factor in the economy of bleaching, agitation is also important, particularly if the beating operation is proceeding at the same time. We have found that when comparing bleaching efficiencies of different hypochlorite solutions such as by making a comparison between (a) bleaching powder solution in its natural condition, (b) the same on the addition of sufficient acid to combine with the base, (c) sodium bisulphite and (d) calcium hypochlorite reduced to combining difference into milk of lime, as well as hypochlorites in the presence of salt, a certain rela-

tionship of efficiencies is obtained with any one particular material at a given concentration, temperature, etc., but if several materials are compared with one another, these various solutions behave relatively differently both in regard to efficiencies, i.e., chlorine consumption and rapidity of action, so that it cannot be said that one particular form of hypochlorite is more efficient than another except in relationship to one given material to be bleached, and under given conditions. For instance, we have compared chemical wood pulps with different forms of cotton half stuff and we have found these different hypochlorite solutions to behave relatively very differently.

Quite a number of papers have recently been published on the subject of relative bleaching efficiencies of the hypochlorites. The conclusions arrived at in most cases are in our opinion most erroneous. First of all there has only been one kind of raw material experimented upon, such as boiled linen, and another material might have led to quite a different order of so-called efficiencies. We have an instance in the above-cited comparison of cotton and linen half stuff and wood pulp compared with cotton half stuff. Secondly, the relative efficiencies have been expressed as chlorine consumption per unit weight of raw material on the assumption that the same bleaching effect is always accompanied by the same chlorine consumption, the higher the figure in unit time, the greater the so-called efficiency. As a fact, the reverse is the case. The relative efficiencies of all hypochlorite solutions should be judged by the amount of chlorine consumed per unit of bleaching effect, and the smaller the chlorine consumption the greater the efficiency. Thus the Hermit solution was found to be much more effective than the ordinary bleaching powder solution because the chlorine consumption per unit of bleaching effect was so much less than with ordinary bleaching powder. This, from the fact that a large amount of unelectrolysed salt is present, may be accounted for by the influence of the undecomposed salt and not by any special qualities of the electrolysed hypochlorite, as it is now found that salt, when added in different quantities to solutions of hypochlorites, has a marked effect upon their efficiency.

In many cases, certainly, the addition of the spent liquor is a doubtful economy, as Messrs. Baker and Jennison clearly show in their paper, but we know cases in practice where the bleaching liquor which would otherwise have to go to waste is usefully expended by using it as a wash water in the breaker, the unbleached material in a very few moments completely exhausting the chlorine, after which, it is slightly further washed and then fresh bleach is added. In this manner the spent liquor is taken out of the sphere of action before the fresh liquor is added.

We have often found that bleaching is much more effective if followed by an acid treatment or by washing and then again bleach added. Many materials seem to come to a full stop unless the bleaching products are removed. Furthermore, the addition of acid

*Results. *Courses on Papermaking*, Vol. 1 p. 57.

after the hypochlorite bleaching very materially improves the colour in many cases. The "more water more bleach" maxim is fully borne out in the results obtained by the Dobson process where the material is bleached with the maximum concentration, the amount of total liquor being only enough to make the material wet, and furthermore, in the old-fashioned method of tumbler bleaching, as was employed in the early days for rags. We have recently drawn attention to the fact that, with some lignified fibres, chlorination is produced in acid solution of hypochlorites (i.e., by hypochlorous acid) but in alkaline solution the ordinary bleaching effect is produced. Either one or the other effect is brought about according to whether the solution is rendered basic of acid, but the behaviour is largely controlled by the amount of boiling in which these lignified fibres have been previously subjected.

The use of carbon dioxide as an accelerator to bleaching powder was patented by Thompson in 1883, B.P. 959. One of us tested this process at the time that it was under investigation by Cross and Bevan, and subsequently suggested in a publication the use of carbonic acid gas by discharging same under the roll of a potcher or hollander in which the bleaching operation was going on. On visiting a German mill many years afterwards we saw this very operation. It is quite evident that a relatively small amount of carbon dioxide is sufficient to produce a marked acceleration which rather suggests that carbon dioxide acts catalytically. Very good commercial results are got, and it is well worth following up, but so far no relative figures are available for comparing the bleaching efficiency of such a solution with that of ordinary accelerator.

We have tested a process which involves the use of liquefied chlorine in steel cylinders. This has been in use for some years on the Continent. This bleaching process in some mills shows a considerable economy, in point of bleaching value and also in actual cost, over ordinary bleaching powder. For this purpose the chlorine is supplied in cylinders under a pressure of 5 atmospheres at 15 deg. C. The process is conducted in the following manner:

The half stuff is run off on an ordinary wet end machine and delivered in rolls containing from 40—50 per cent. moisture. These rolls are packed through a manhole door into a large rectangular content-lined chamber. The chamber is then hermetically sealed. The cylinder containing chlorine is placed on a weighing machine and connected up with the chamber, and chlorine gas passed in equal in weight to 2 per cent. of the dry weight of the material under treatment. At the beginning there is considerable pressure in the chamber. After a few hours the whole of the chlorine is absorbed, there being no trace of chlorine when the workman enters for the removal of the rolls. The rolls are penetrated to the interior and uniformly bleached. There are no lime salts, but of course a slight hydrochloric acidity, which is sufficient to dissolve any basic salts already present in the half stuff. The bleached stuff, which is now placed in the beater, generally receives a slight further treatment with bleaching powder solution. In a case of cotton rag half stuff, which under normal circumstances requires 12 per cent. of bleaching powder, the consumption by the above treatment was 2 per cent. of chlorine + 2 per cent. bleaching powder, and with a better color produced than can be obtained by bleaching powder alone. The point here is that apart from a better

colour, 2 per cent. of chlorine as gas replaces 10 per cent. of bleaching powder, and therefore 2 per cent. of chlorine as gas is equal to 3.5 per cent. chlorine as bleaching powder; that is, the bleaching efficiency of chlorine as gas in this case is nearly double that of bleaching powder. In fact, for equal colours it is probably more than double, but in point of fact it shows quite as great an increase in bleaching efficiency as an electrolysed solution of magnesium chloride + sodium chloride does over that of ordinary bleaching powder. Besides seeing it operated as a regular process in Germany we have tried it in this country. The only difficulty here is the question of transport of the compressed chlorine in cylinders, which is not an easy matter to arrange with the railways.

With iron mordanted rags, bleaching powder sets the iron in a more insoluble condition. In such cases, when bleaching powder is used, it is preferable to acidify for the removal of the iron before adding the bleaching powder solution. Otherwise the iron salts frequently refuse to dissolve by subsequent acid treatment, but in the case of chlorine, the iron is chlorinated and consequently easily removed by subsequent washing. In Germany the Badische Co. are able to supply to some mills chlorine in this form at a rate that renders the process cheaper than using bleaching powder. They generally supply the gas in cylinders for use by bubbling into caustic soda, 12.87 kilos. of chlorine being required to transfer 100 kilos. of lye of 14.5 per cent. NaOH into bleaching liquid (sodium hypochlorite.)

Some years ago one of us made trials in a paper mill on a commercial scale with potassium permanganate in comparison with bleaching powder, and found that 1 lb. of bleaching oxygen as contained in permanganate did just as much bleaching as 5½ lbs. of bleaching powder oxygen when reckoned from the available chlorine equivalent of ordinary bleaching powder. The rapidity of attack in the case of permanganate is infinitely greater. Generally speaking, the rapidity of attack and bleaching efficiency seem to go together.

The foregoing examples, which might be multiplied, merely serve to show that there is a range of bleaching efficiency varying with the bleaching agents and the materials operated upon, as well as with the conditions employed.

In spite of all the work that has been done upon the subject, the economic problems involved in such operations offer one of the most promising fields for industrial research. To arrive at practical conclusions it is most important that the work should be done under mill conditions, or at least having due regard to mill conditions.

It is perfectly clear, therefore, that in the case of disputes as to the bleaching qualities of pulps, etc., a great difference of opinion might exist between the two parties, and it is a most desirable thing that a uniform and standard method should be agreed upon not only in case of dispute, but also on the question of making contracts. Messrs. Baker and Jennison have made out a very excellent case for their own standard which could easily be worked out in an ordinary laboratory, and the proposed to use standard colours in the form of porcelain is far more valuable than recording the colours by means of the Lovibond Tintometer and would appeal to the practical man. We would suggest, however, that instead of specifying that a pulp should exactly correspond with any particular one standard, it should be specified that it

should fall between two of the standard colours, on account of the fact that there might sometimes be a dispute as to which of the particular standards it most

closely corresponded with, but, if it falls between two, then there can be no question, and it gives a slight latitude to the manufacturer.

PAPER MILL VENTILATION AND HEATING

By ALEX. ANNANDALE

(Written Specially for Pulp and Paper Magazine)

These two points are very important in every paper mill, and as the one naturally associates with the other they may well be considered together.

To begin with there are two incontrovertable facts. First, hot air naturally ascends and second, cold air naturally descends. The questions we have to consider is how the questions of ventilation and heating affect the paper machine. Taking the question of condensation. This may be put into mill language very simply in the words "Drops from the roof." These drops are most troublesome in the machine house, because there they are always particularly prevalent over the wet end of the machine, and by falling on the wire they cause many breaks and much broke.

In other parts of the mill they are also very annoying, as many a man knows when he gets his shirt soaked through four after four, with these drops, which are always of large size, and most discomforting. Besides this personal view, one has to consider the injury to any roof which is always dripping with internal moisture.

Everybody knows that the colder the weather, the more trouble the drops will give. All machinemens know, that starting up on a cold Monday morning, is the time when the drops are at their very worst.

The dictionary says that "to condense" is to reduce into a denser form, as from gaseous into liquid. Well that is just what happens in a machine-house, where there is everything needful to produce condensation. A great deal of evaporation goes on, as all the moisture dried out of the paper has eventually to be absorbed, and carried away by the air.

Just as soon as a paper-machine starts up the evaporation commences, and presuming that the atmosphere in the house was absolutely dry to begin with, and that ventilation is faulty, in a short time it will be thoroughly saturated with water. You cannot see the water and often you cannot even see soft steam clouds, but the water is there nevertheless, and when ever that water saturated atmosphere comes in contact with a surface cooler than itself, the water promptly condenses and you have a copious supply of drops.

We do not think that any hard and fast line can be laid down for getting rid of this wet vapour; because most machine houses are differently constructed therefore each case should be thought out on its own merits. The great thing to remember is, that the best and most economical way to set to work, is to use experience and common sense, to assist natural laws, rather than to try to fight against them. That, you may be certain will never pay.

Putting the matter broadly, the ideal way of ventilating a machine house, is to have a sufficient supply of air, and moderately warm air entering at, or near floor level. This will naturally rise upwards, and as it rises it will absorb more heat and moisture. What happens next will largely depend on the style of

the machine-house roof. If it is a flat, or nearly flat roof this body of warm and wet air will spread all over and condense more or less all over, but decidedly most, above the wet end, because there you have no continuous source of heat like the dryers, and consequently the roof at that point is cooler.

You can check the condensation there considerably, by having a few lines of steam-heated radiating pipes near the roof, but these while a help are not by any means a complete cure, whether one has a flat or A shaped roof.

In Scotland and England, as a pretty general rule, each machine has an A shaped roof over it, which of course necessitates a valley gutter between each machine. These in the climate there, give no trouble, but in a country where there is a heavy snowfall they probably would be troublesome. However, for ventilating purposes the A roof is certainly good.

With properly constructed ventilation along the ridge, and a few lines of low pressure, steam radiating pipes, above machine and wire, they wash well, and with them, these most unsightly hoods over the dryers can be entirely avoided. Sometimes this class of roof and ventilator are helped by fans in drawing the saturated air out, but in the writers' opinion it is better to blow in warm dry air at or about floor level. It will rise up carrying with it the saturated air and pushing it out of the ventilator in accordance with natural laws. So much for A shaped roofs.

As to flat roofs. If it can be arranged at all, top ventilators should be fixed above the machines. In a cold country means should be provided for regulating the amount of opening, because the colder the outside temperature the greater will be the desire of the warm air to rush out, but against that the colder the outside air the more it will want to get in, so in practice it will be found that the colder the weather, the more the top ventilators will have to be closed, and also the bottom inlets through which the fresh air is admitted.

With a flat roof, we do not think there is much prospect of getting efficient ventilation entirely with roof ventilators; so it is necessary to fall back on fans to some extent to complete the extraction of the saturated air. These fans must be judiciously placed, so that they may do efficient work. It is also well to remember that a few good large fans will do better than a larger number of smaller ones. Better have too much ventilating power, than too little. In placing a fan always ask yourself, if you are going to place it where it cannot avoid doing the work it is put there to do. Do not put a good exhaust fan right opposite a constantly wide open door, such things have been done, and expect it to do its work. You may be sure that it will draw through the door, as that will be natural and more easy than shifting the saturated air you want it to remove. Fix your fans so that they cannot get any air other than that you want moved out.

So far we have been in the machine-house; but before saying anything about heating, we may say generally, that wherever you have a room with steam escaping into the air, there you will have roof condensation, unless your ventilation is right. Generally, the machine and grinder rooms are two worst places. When considering heating, it is well to remember that when you are planning the heating of any department you should arrange your heating appliances in such a way as to assist your ventilation.

The writer likes to see every department of a mill well ventilated, not cold and draughty, but with just a decent atmosphere in which men can do their work well and with comfort and not go off tour used up, and limp, owing to the want of a reasonable amount of fresh breathable air.

Heating mills in this country is quite a serious proposition owing to the severe winters. It is quite a large and unavoidable expense.

So far as the writer's experience has yet gone, it can be done most economically by exhaust steam, if available—or if not, by steam reduced to not more than four or five pounds pressure.

It is a great mistake to use a lot of grids made from small malleable iron pipes. They do not last, have far too many joints and cost a great deal too much to keep up. It is far better to use Gilled Cast Iron Pipes, a far smaller number give the required result, as they throw out a wonderful lot of heat. They can be fixed at small cost, and unless deliberately smashed, will last at least a life-time.

In conclusion, we would say use common-sense when arranging your ventilation and heating. If you are in doubt as to the working of your ventilation, make some smoke at various points in the department under consideration, and watch how the smoke travels; that will give you a good notion of what is going on in the way of air currents.

Do not on any account fight against nature by trying to make hot air go down, or cold air go up, and do not expect ventilation and freedom from drops unless you let out your saturated air. It wants badly to get out and you also want to be rid of it, so why not give it vent by the easiest possible route, and let it go, by so doing you will save many a break on the machine, and all the numerous "cuss" words extracted from the machine staff by "drops from the roof."

THE TEUTONIC WAR LORD

SERIOUS POSITION OF PAPER AND PULP INDUSTRIES.

All British Eyes Turned to Canada for Succour.

(From Our London Representative.)

The German Emperor has driven his mailed fist through the peace of Europe and shattered it to atoms. The result is that the peace of more than half a century has been broken, and the British nation finds itself at war with a hitherto friendly people, to which are bound not only the ties of kinship, but also an immense volume of reciprocal trade, which now becomes shattered for probably another decade or two. Between the people of Great Britain and Germany—and when I refer to Germany I very naturally include the papermakers and the pulp producers, who have traded with us so long—there is not and there never has been any quarrel. Commercial interests, friendly rivalry in science and engineering, and scientific research, along with a mutual desire to forward projects for the good of mankind and industry, have helped to bring the Teutonic and the British people into close touch, and they have found much in each other to admire and adopt. Business relations were never on a better footing, as was proved by the visit some time ago to London of the highest officials in the German Press, and the reciprocal visit to the "Fatherland" by representative ships of the British Navy. But all these events have now become things of the past, and the Continent of Europe is shaking to its foundations with war, unprecedented in extent, and, I fear, in horror. In the midst of these unparalleled conditions all eyes in British territory were turned toward Canada for help and succour, and I am glad to say that the Dominion has nobly responded, so much so that when the news of that help and succour was flashed to the Antipodes the Premier of New Zealand vividly summed up the position in three words, when addressing the legislature, "Well done, Canada."

Before dealing with the condition of the pulp and paper markets, I think a little enlightenment on events prior to the European crisis would be found interesting. In London we have something like 40,000 German people, and a huge proportion is engaged in the paper industry in many ways. We have also Finnish people in our midst, and a few Austrians in the same industry. Naturally the business relations going on between London and the principal paper and pulp centres in Germany have been very great. Everything worked smoothly, and not a discordant note has been heard. The same applies to the Finnish paper and pulp men, as well as the Swedes and Norwegians. We all appeared to be one happy family, though the number of Englishmen interested in our industries might be counted on the fingers of one hand. I have seen German naval men entertained here, including the Kaiser, and I know how they enjoyed themselves; I have stood in a dense crowd of Englishmen, who came straight from their desks in paperdom, to shout "Viva La France," as President Poincaré drove by in decorated streets on his way to Paris. I have seen the representatives of the Austrian Royal House cheered on leaving King George's palace; and I have dined with the German, French, Finnish, Austrian and British paper and pulp producers, who, as if one man, rose en masse to toast the health of the King of Great Britain, and sing the National Anthem. The other night, outside Buckingham Palace, I heard the British and French people sing "Britons never, never shall be slaves." I could not see any Germans in that dense crowd of Britons and Frenchmen, but variously enough I espied a well-known Austrian paper and pulp agent. The German absence was attributable to the dread

of world-wide conquest which the Teutonic War Lord has been having recently. He has compelled paper agents and pulp agents to quit this country for the "Fatherland," and their offices are now desolate—probably the occupants of these have found their resting-place in Belgian territory, as I pen these words. At all events, Kaiser Wilhelm says:

In times of peace I work up wars,
 Mein vas der helm and spear of Mars,
 Vat care I vor den douzand Czars,
 Meinzelf—und Gott!

That's the position in a nutshell, so to speak, and that is the position which left pulp and paper men situate in London and Manchester in such a predicament between the 4th and the 13th of August, that they were beginning to come to the conclusion that the British Isles had fallen into a state of seige. Prices of paper and pulp could not be obtained on any pretence from the continent. Wireless was even called on for assistance; but all in vain, and the pulp importers had to assume the role of the infant child and be spoon-fed with the few small parcels that trickled in from Norway and Sweden, through the courtesy of the British fleet.

The position then, was, that paper mills in England, Scotland and Ireland, were clearing out what stocks they had in hand, to meet current contracts, and prices for new business rose rapidly. Dealings in pulp in London and Manchester became less and less by degrees, and the few parcels placed on the market soared high in value, the owners of which demanded money down for all spot transactions. The feeling, I need hardly say, of the prospect of no pulp arriving from the continent caused a thrill to go through one's body, until the welcome news arrived that the British fleet had made the coast clear for shipping to and from Norway. Prior to the reception of the news, papermakers were beginning to look to Canada for the raw materials, and paper agents and merchants were wondering what the stocks of newsprint were like in all the producing places in the Dominion. The demand for newsprint, owing to the war news in newspapers, was—and is still—exceptionally great, and the prices increased from 3 cents to 4 cents per pound. In one case I know 4½ cents per lb. was paid, and if there is any spare newsprint in Canada the sooner it is delivered in England the better off will be the producers. Everything points to the States dealers and jobbers trying their hand as middle men in the handling of Canadian newsprint, because they know it is appreciated in English circles. Those who have direct dealings with Canada in pulp and paper on this side find the prices in a very happy position in the present crisis, but I would like to see the men of the Dominion taking a greater hold on the British pulp market and a greater interest in it than they have done so heretofore. Now is their time to tackle shipping rates and get the ground wood, and any sulphite or sulphate that is available shipped here. As a rule, as a matter of fact, in a British custom—war suspends all contracts, that is the position with Scandinavia today unless the British fleet will keep the waterway clear between the English coast and Christiania. Then, of course, German pulp or paper cannot enter any part of the British Isles until peace is declared, because the King's proclamation issued on the 5th of August, forbade any business dealings of any kind with the enemy's countries. The German position should therefore, be as critical as the British, neither by Canadians, and held in check. It is only a matter of dealing with the situa-

tion—and it is a subject that the Pulp and Paper Association in the Dominion should tackle without the slightest delay. All the newspapers north, south, east and west of the British Isles are cut down to the smallest minimum. The London "Sunday People" says, in a notice to its readers:

"The importation of pulp from the Continent, from which printing paper is made, being rendered impossible just now owing to the war, it has been found necessary to lessen the size of newspapers, and thus avoid a paper famine. 'The People,' in common with other Sunday papers, is therefore reduced to-day to 12 pages." The "London Evening News" says: "An acute famine in paper has set in not only in England but also in France and Germany. Last night's London evening newspapers showed signs of the stress of the time. Thus the 'Evening Standard' has been reduced from twenty pages to twelve and the 'Pall Mall Gazette' from twelve pages to eight. It is understood that drastic changes in the size of newspapers will take place in the immediate future owing to the impossibility of obtaining raw material from Norway and Sweden." "The Times," "Morning Post," "Daily Telegraph" (the proprietors of the latter journal, like those of "The Times," have their own paper mills) are also reduced in size. The French papers are also feeling the scarcity of paper, as I see several journals are reduced to double and quad crown sizes. In England numerous publications have been dropped altogether and publishers, as well as newspaper owners, are doing their utmost to husband their paper stocks and supplies. Again, I repeat, now is Canada's time in the British market for newsprint and the price is good—money down if needed.

But while the position in England is bad for paper and pulp supplies, I learn that the manufacturers in Sweden and Norway are also in a precarious position. No exports to the United Kingdom can be undertaken owing to the mines floating on the sea route, the Germans have indiscriminately mined the route in parts, with the result that shipping is dangerous. A week has passed in Norway without an English mail arriving, and when letters cannot be delivered, it stands to reason that pulp and paper cannot be exported or imported. I also learn that Norwegians have been short of coal and mills have had to close down. This is a serious matter, but as I pen these lines it is most likely that coal is getting through to Norway, though the British Admiralty say they cannot give any reassurance that the route will be clear for any length of time. Before the war broke out the pulp markets of Scandinavia were dull and depressed, but now prices have leaped higher to the extent of 10 and 20 per cent. Norway, however, is shipping sulphite and sulphate to America and very likely some of it will find its way back in England and Scotland. All employees in Norwegian and Swedish mills—at least in most of the mills—are under notice to leave, unless there is a sudden change in the political horizon before long.

The financial question has also to be considered in Scandinavia, and the same may be said of England, Scotland and Ireland. In London the Bank of England rate rose to 10 per cent and the government is issuing as much paper money as possible. Millions of \$1 and 10s notes are in circulation. At the St. Mary Gray Paper Mill, the government stepped in and took charge of the paper—or at least that which is of the same quality as stamp paper—and supervised the water-marking and other processes. The special wa-

ter-mark resembles the monogram "G.R." (George Royal) at intervals of half-an-inch through the paper and the production is used for the new £1 and 10s. notes. While this was going on, the owner of the Cray Valley mill took his place in his regiment as a Lieutenant, and he is now serving his country. Indeed, many of the paper mills and paper and pulp offices have been deserted by workers who are now serving with the colors in some shape or form. The war has also caused papermaking machines in some of the British mills to be closed down temporarily.

Naturally at a period like the present the demand for paper by the government is extremely great. Some of the departments are working day and night, and the firms who hold government contracts have never been kept so busy in their lives. When the news leaked out that the relation between Germany and Great Britain were becoming strained, the daily and weekly newspapers also showed great activity and the rush for newsprint was something enormous. When it is remembered that some of the daily papers circulate up to a million copies per day, one must realise the stock of newsprint that must be stored. I counted 50 tons of newsprint one morning going into a newspaper office, and since then the rate has been on an average of 40 tons per day for a week. This is only one daily newspaper what must the other offices be storing! Thousands of tons of newsprint have changed hands in less than a week and, of course, the British newsprint producer is reaping a nice profit, because those who deal in Scandinavian and German newsprint cannot get a supply for their customers. Up to the week ending August 8th, the supplies of pulp from various sources were large, but these will not last long owing to the great demand for paper, and it is difficult to anticipate what the next few weeks may bring, particularly as England is at war with Germany and Austria, France at war with the same nations and Germany and Austria at war with Serbia and Belgium, France and England—a complete "burst-up." Germany has been underselling the British manufacturer of paper for years past at home and abroad. And it is also a known fact that the German pulp and paper industries—in common with the remainder of her industries, such as textiles, chemicals, etc.—have been in very low water during the past few years, and in all probability this backward state of things has some bearing on the present warlike condition of the "Fatherland." The war, at all events, has paralyzed trade in Europe, and raw materials in England in the way of chemicals, such as bleaching powder, caustic soda, soda sulphate (salt cake), have jumped in prices from \$4.80 to \$9.60 extra. It will take Germany another generation to recover what has been lost in commerce in the paper and pulp industries in England and Europe and the countries the Teutons trade with overseas. What a catastrophe! Everyone in England is asking if the "Supreme War Lord of Germany" is in his sane senses, for not content with going to war with England and France—enough in all conscience to get on with—and threatening Portugal, he proceeded to add Russia and Belgium to his list. Having sent ultimatums broadcast, one can picture this over-allness Kaiser turning to his Chancellor and saying, "Hollweg, have we forgotten anybody?"

George W. Pauline, sales manager for Ritchie and Ramsay, Limited, Toronto, who has been spending the past few weeks in the Old Country, has returned home.

The Union Bag Fire

Not a small factor in the present shortage of news print materials was the loss on July 24th, of 10,000



tons of ground wood, logs at the mill of the Green Falls Company—Union Bag Company—at Cap a la Made



leine, near Three Rivers, Que. Above, through the courtesy of Mr. Gustav Fornstedt, of the Wayagamack Pulp and Paper Co., who furnished the photographs, may be seen the fire under way. After four days only a tangled mass of binding wires and some half-burned bales remained to indicate the spot where one of the greatest reserves of pulp in the country had stood.

LAURENTIDE BOND ISSUE.

On September 23rd, the Laurentide Company will hold a meeting of shareholders to authorize the issue of \$4,000,000 6 per cent bonds. The reason for the step is that the board has decided that it would be in the interests of the company that the balance of funds required for the prosecution of the work of construction of power plants at Gran, Mer, should be provided from bonds rather than from other sources. The bonds will be 6 per cent 30 year consolidated mortgage bonds. No issue of these will be made, however, until the war situation clears.

THE EUROPEAN WAR AND THE U.S. PAPER TRADE

(Special to Pulp and Paper Magazine.)

New York, August 25, 1914.

The European War caused considerable disturbance in the paper trade of the United States. The first week caused a great deal of excitement in all branches. A great deal of the nervousness found expression only in talk. Real activity and facts developed in comparatively few cases.

For the past six months the paper business has been very quiet in most lines. Prices in all grades had weakened considerably, as mills were taking orders simply to keep their machines running. Jobbers have allowed their stocks to deteriorate and they have bought only what they needed. Small orders were scarce and there was no need of carrying any great stock on hand.

Advertising has been very poor and newspapers had not consumed more than about 80 per cent of their contract supplies during the first six months. The Mexican war scare gave a temporary boom to the consumption and left a general falling off of about 2½ per cent. At the outbreak of the European war, newspapers were somewhat below their contract consumption. At this time the demands have been so heavy that they are now about ten per cent above their contract quantities. The last week or ten days have shown some notable cuts in the sizes of newspapers. Instead of 16 to 22 page editions, 12, 10 and 8 page numbers are in the majority. Transient business has been scarce from the first of the year and still is. All the activity in news has been confined to contract orders.

Most worry in the trade was regarding the sulphite situation. The tie-up in international shipping caused some rather serious difficulties with regard to the 1,000 tons a day imports of chemical fibres for domestic consumption. Importers were inclined to hold what little pulp was on dock or in transit for shipment to consuming customers. The feeling was to make a fair division of the pulp supplies here among the contract customers and clean up the supplies on hand at a fair profit. Some importers made attempts to buy up supplies of pulp on speculation and move it at future prices. Advances on bleached sulphite were reported anywhere from ten to thirty dollars a ton. Only small lots were sold at these advances, and then only to mills which had very low stocks at hand. After the first week or ten days importers found that paper mills were not so badly in need of sulphite that they would pay any price for it. Bleached sulphite is of interest to mills at prices ranging from 2.65 to 3 cents. In some cases when these prices are too high for consumption under the present business conditions, unbleached sulphite has been quoted at fair retail prices, but very little was sold.

Foreign news has been very scarce, as many suspension arguments were created during the past two months. Mills have fairly good supplies on hand, and are not particularly worried for the immediate future business. There is not a poor demand for fine papers, and printers are not satisfactory enough to warrant any unusual prices for stock. Importers of foreign rags

have been inclined to speculate in the domestic rags market, where packers are holding fairly good supplies of all grades at absurdly high prices. Shrewd dealers in the New York market are moving all the rags and paper stock they can at a fair profit. They are also well aware of the kind of packings that are likely to be shipped in times such as this and label all their consignments: "No rejections after thirty days can be considered. Goods bought with this understanding by mills." The dealer can put no guarantee on any rags collected now for packers have filled their warehouses with all grades and have made very poor sortings. Roofing rags, it is said, are nowhere being packed according to classification.

Bagging advanced about \$3 a ton for all grades, but very little business was done, as imports have been very light for several months past. High offers have been made by paper mills for manilla rope, which is very scarce. One offer of 4 cents a pound for a ear load was made in New York.

All grades of domestic rags advanced from ½ to 1 cent a pound during the interval. Supplies in packers quarters accumulated only because the demand for them has been very poor. Collections of rags have been very small this year, as textile mills and clothing manufacturers have been only running on part time. Their waste has been small and packers are very largely dependent upon this source for their rags. Under ordinary conditions, domestic rags cannot supply more than half the demand for rags.

The scarcity of pulp has led to demand for all substitutes of pulp. All sulphite and kraft waste papers have been in good demand. Prices went up in all grades from 10 to 20 cents a hundred pounds. Old krafts and manillas have been in unusually good demand as the raw material for both grades has been scarce.

The most notable change in the paper situation has been in the heavy movement of newsprint through contract channels to consuming centers. This was also accompanied by a heavy demand for newsprint from Australia, South America, South Africa, France and England. The early weeks saw a demand for the immediate shipment of about 12,000 tons of news to the above mentioned countries. There was no advance in price, except for English export, where it was reported the price was 2½ cents domestic ports.

Other developments in the United States paper industry were the universal withdrawing of prices and refusal to make contracts, all orders being confined to what is considered a thirty days' supply. Some manufacturers of wrapping papers advanced their prices; it was said from \$3 to \$40 a ton for orders for immediate shipment. The demand for wrapping papers has been very poor, and it was the opinion of one important factor in the trade that the best advance for any grade of wrapping was \$3 and it was also his opinion that very few of the wrapping mills would turn down an order at the values prevailing before the war began.

Ottawa Notes

Ottawa, Ont., August 25.—The outbreak of war, with its expected demand for news print and the raw material thereof, has already had its effect on prices in Ottawa. News print has gone up from \$42 to \$45 for new contracts and this price is expected to be maintained, if not exceeded, for all contracts made hereafter while the present situation endures. The demand is very good. Sulphite pulp has increased \$8 per ton and is now selling at \$44 and \$44.50. The J. R. Booth Company, which had its pulp mills put out of business for a month some time ago owing to an accident, had to purchase a quantity of sulphite pulp for which \$44.50 was paid after the announcement of war. Groundwood has gone up \$2 per ton.

Every effort is being made to expedite the completion of the new 50-ton sulphite mill at the Booth plant in anticipation of the expected demand for that product. Mr. W. H. Rowley, president and general manager of the E. B. Eddy Company, states that provided his firm can obtain certain materials needed in the manufacture of their products and which have been obtained largely from foreign countries, it will continue to operate at full time. Among the materials which are imported are certain chemicals, clays, metals, chlorides, dyestuffs, etc.

Prospects for both the lumber and pulp and paper industries having improved considerably since the first outbreak of war, and the gloomy prophecies made at that time having been more or less discounted since, more men will probably be sent into the woods by local firms than was at first planned. The J. R. Booth firm some time ago announced their intention of sending in only 1,000 men, but are now considering the despatch of a larger force if prospects improve. Shepard and Morse have 450 men in their camps at the Kippawa and Quinze rivers, 25 more than last year. The Hawkesbury Lumber Company and McLachlin Brothers will cut about the same quantity as last year.

The completion of a new dam and log slide at High Falls on the Lievre River, part of a scheme of conservation work which the MacLaren Lumber, pulp and paper firm of Buckingham, Que., is carrying out on that stream, is announced, and details have been given out of the work. The new dam is a large structure and is of a permanent character, designed not only to assist in the lumbering work carried on by the company, but also to develop power for which a use is hoped to be found later. About 100,000 horse power, it is estimated, can be developed. Five power flumes, each of which will provide 10,000 horse power, have been constructed at High Falls, where the river drops 160 feet, and when a use has been found for the power the water will be turned through these. Besides this a log chute has been constructed which is said to be unique of its kind. It replaces a wood structure with a capacity of 15,000 logs in ten hours, is itself built of reinforced concrete with a V shaped trough, and can accommodate 50,000 logs in a ten-hour period, with very little overseeing. It is claimed that the chute, which was built by Mr. John B. McKee of Ottawa, is the only one of its kind in Canada, and if there is any other in another part of the world it has not yet been heard of.

Another important work which has been carried on by the MacLaren Company for some time and has

been further extended during the year is the building of a forest telephone service. This service, which connects the head office at Buckingham with every part of the limits, also furnishes a service to the villages and towns on the Lievre. It now extends from Buckingham to Ferme Neuve and is 88 miles long. The line gives valuable aid in controlling operations in the woods and in preventing fires and is made use of by the settlers throughout the district. The MacLaren firm is also carrying on throughout the Lievre Valley a splendid work of conservation. The large limits are being surveyed by a firm of forest engineers, and when the full report of the latter has been handed in, it is believed it will be possible to devise a scheme of making the supply of wood from limits perpetual. It is believed the annual increase will easily support the annual cut of both the lumber and pulp mills. It is also planned to dam the tributary streams of the Lievre as well as the main stream and the reservoirs obtained in this manner will be used to conserve the level of the river during the late summer.

Will an export duty be placed on Canadian pulpwood as a war tax?

According to the statement of Hon. W. T. White, Minister of Finance, made in Parliament last week, such a method of raising additional revenues for war will be taken into consideration in the future when further need for supplementing the usual avenues of taxation arises. The minister's statement was made in reply to an observation by Mr. E. M. Macdonald, Opposition Member for Pictou, N.S., who stated that a tax on fancy matches or an export duty on pulpwood would be preferable to increasing the duty on sugar as had been done. Mr. Macdonald stated that, "the cost of paper abroad might well serve the purpose of contributing to our revenue. Our great natural resources in this respect will be drawn on, particularly at this time, by reason of the extra demand for paper arising in other countries."

Mr. White's reply was as follows: "So far as an export duty on pulpwood is concerned, that matter was not under my consideration, but I shall be glad to take it into consideration in connection with any future action we may have to take for the raising of revenue of a special character connected with the war."

The water in the Ottawa River, Gatineau and tributary streams is lower than ever, and some of the mills deriving their power from the Chaudiere Falls are already contemplating having to cease operations at an early date. It was rumored, in fact, that J. R. Booth would close down his plant shortly, but the company states that this is not the case, and that every effort will be made to continue operations as long as possible.

As an evidence of the good that has already been accomplished by the newly-formed Lower Ottawa Forest Protective Association, to which all the pulp and paper firms in the Gatineau, Lievre and Rouge River districts belong, it is reported that the chief fire inspector of the association has since its inception had no less than 40 persons, guilty of carelessness in starting fires in the woods, convicted and fined. What promised to be an extensive fire in the Campbell and Stearns limits near Thirty-One Mile Lake, Que., recently, was promptly reported by rangers and extinguished by the staff of the association before much

damage had been done while a number of minor blazes have been extinguished.

The Canadian Trade and Commerce Department is co-operating with Canadian paper manufacturers in discovering new trade opportunities in the present war situation. A bulletin which has been issued to manufacturers from the Department this week points out that imports of paper by Britain from Germany in 1913 totalled \$2,017,575, compared with Canada's export of \$587,910 and urges that Canadian manufacturers should endeavor to capture this trade. There have been many inquiries for Canadian pulp, pulp-

wood and paper, one French newspaper in Bordeaux, France, having cabled across for supplies of newsprint.

The war with Germany will probably afford Canada an opportunity to improve its export to Great Britain, which as regards pulp and paper has been declining greatly during the last five years. Recent trade figures issued by the Trade and Commerce Department showed that Canadian export to Great Britain of paper not on reels has fallen from \$421,985 in 1909 to \$2,395 while the export of ground wood fell \$725,190 in the five years.

MAC.

THE USE OF PERMUTIT IN WATER SOFTENING

The question of water supply is, perhaps, the most important of all in the manufacture of paper. Every class of mill has to give earnest attention to the cleanliness and the softness of the water used, in order to turn out clean paper to keep boilers clear of scale and wires from becoming clogged. The investigations of J. F. Garrett upon a new filtering agent have been watched with great interest in the United States. In an address before the Illinois Water Supply Association, quoted in "Water Supply," Mr. Garrett sets forth his ideas.

The chemical used is called permutit. It is an artificial zeolite recently produced and patented by Dr. R. Gans of the Royal Prussian Geological Institute of Berlin. The use of permutit is comparatively new and its commercial possibilities have been investigated only to a small extent. It is prepared by smelting aluminous silicates with sodium carbonate and sand and washing out excess of sodium carbonate with water. Its chemical formula is $2\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{Na}_2\text{O} \cdot 6\text{H}_2\text{O}$.

The most important characteristics of this compound are:

1. Its property of interchanging bases. This property is very significant, for by replacing the sodium base by other bases it is possible to make a permutit of almost any metallic combination. The exchange of greatest interest, however, is the exchange of sodium for calcium or magnesium by which the hardness of water can be reduced to zero. The iron, manganese, and organic matter can also be removed from the water through this property of interchanging bases.

2. Its property of regeneration. Upon passing hard water through permutit, the sodium content of the latter will eventually become exhausted, being replaced by the calcium and magnesium contained in the water; hence it is necessary to regenerate the permutit. This can be done by passing a 10 per cent solution of common salt (NaCl) through the permutit.

3. Its length of life. It is claimed that permutit can be regenerated an indefinite number of times without loss, hence it is never necessary to renew the charge in the filter.

The permutit filter consists of a steel shell made in various sizes for the treatment of various quantities of water. The shell is fitted with pipes and valves in order to give the necessary mechanical treatment to the water and also to enable washing and regeneration with a salt solution. Inside this shell a layer of permutit is placed between two layers of gravel,

through which the water to be purified is passed at a comparatively rapid rate. During its passage the calcium and magnesium salts react with the permutit, turning the sodium permutit into calcium and magnesium permutit.

This process differs from most water softening processes in that an excess of insoluble reagent is used instead of a small amount of soluble one.

Permutit may be used in practice in two forms, namely: (1) sodium permutit for the removal of calcium and magnesium and (2) manganese permutit for the removal of iron, manganese, and organic matter. The sodium permutit is perhaps of greatest commercial importance because of the large number of industries that require water free from calcium and magnesium. The sodium permutit filter will reduce the hardness of almost any water to zero, at a very low cost. Hence the advantage of permutit-treated waters for boiler purposes, dyeing, bleaching, and laundry work, are undoubtedly very great.

The manganese permutit is prepared by passing MnCl_2 through sodium permutit and then washing with calcium or potassium permanganate. This treatment forms the higher oxides of manganese which cling mechanically to the granules of permutit thus exposing a very large, highly oxidized surface, which will remove the iron, manganese and organic matter from the water.

The essential difference between the action of the sodium permutit and the manganese permutit is, that in softening water by sodium permutit the substances eliminated from the water actually enter into combination with the permutit and consequently there is no precipitation and no clogging up of the filters but in the manganese permutit the oxidizable substances in the water are actually precipitated and tend to clog up the filter.

The regeneration of the sodium permutit filter requires about eight hours. A 10 per cent salt solution is run into the filter and let stand for about six hours, after which it is drained out and the filter washed. The filters must be regenerated once every 24 hours. This can be done at night, enabling the filter to be used every day. The capacity of the filter does not deteriorate with use that is, the capacity of the filter at the end of a year's run is the same as at the beginning. Hence, after the cost of installation, the only expense is the cost of salt for regeneration, which in this section of the country is about 2c per

thousand gallons of water of 350 p. p.m. (CaCO_3) hardness. Of course, the cost of salt will vary in different localities which will cause variations in the cost of treatment.

In order to regenerate a manganese-permutit filter it is necessary first, to break up the filter bed and wash out the accumulation of iron oxide, etc., that has been oxidized and precipitated in the filter. After this has been done, the filter is reoxidized by means of a solution of calcium or potassium permanganate.

Mr. Garrett made a number of analyses of tap water before and after treatment with sodium-permutit. In making the analyses he used the "rapid boiler" method which is used in the State Water Survey laboratory. The following results are the average of twenty-five analyses, and serve to show the comparison between the treated and untreated water. The results are expressed in parts per million:

	Na_2CO_3 Alkalinity				
	as	Methyl			
	CaCO_3	Orange	MgCO_3	CaCO_3	Na_2CO_3
Untreated water	82	348	192	115	87
Treated water	388	399	000	12	412

The presence of 12 p. p. m. CaCO_3 is doubtless due to the presence of CO_2 in the untreated water, which drives the reaction toward CaCO_3 instead of Na_2CO_3 . $2\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{Na}_2\text{O} + \text{Na}_2\text{CO}_3 \rightarrow 2\text{SiO}_2 \cdot \text{Al}_2\text{O}_3 \cdot \text{Na}_2\text{O} + \text{CaCO}_3$. However, CO_2 can be easily removed by passing the water over limestone.

The following brief abstracts show the possibilities of the use of the process in practice in a few industries.

Basch in an article on "The Use of Permutit to Purify Boiler Feed Waters," states that the presence of alkali in water prevents the corrosion of iron but causes foaming and that the presence of NaCl counteracts the effect of alkali. Hence waters treated with permutit cause foaming and yet do not prevent corrosion because of the presence of small quantities of NaCl . However, other writers state that at least fifty boiler plants in Germany and over one thousand in Germany, France, England, and the United States are employing this system of treatment and none of them have had any trouble with corrosion, scale, or foaming, since this process was introduced.

It is claimed that for dyeing and bleaching purposes, water treated by the permutit method is equal to distilled water and is much cheaper.

The use of permutit for laundry purposes has many advantages over the lime and soda process. Water cannot be softened to less than $3\frac{1}{2}$ grains per gallon or 60 parts per million (CaCO_3) hardness by the lime and soda process, while it can be softened to zero by means of permutit. The cost of treatment is approximately the same with either method. The permutit-treated waters also contain a considerable quantity of bi-carbonates which aid in cleansing and are ordinarily added to waters used for laundry purposes. Another important advantage of the permutit filter for laundries is that it automatically adjusts itself to waters of varying degrees of hardness. The mechanical adjusters used on lime and soda softeners are efficient for a short time, although they require constant attention, but the action of the lime soon throws the gears out of adjustment and hence the water is not properly treated. All these difficulties are avoided in using a permutit softener.

Some of the advantages claimed by H. G. Anders for the use of permutit are:

1. "Any water may be softened to any degree of hardness by regulating the flow."
2. "The filter works automatically."
3. "Variations in the feed water do not affect the filtrate."
4. "The number of regenerations of the filter is unlimited."
5. "Iron, manganese and organic matter may be removed by using manganese-permutit."
6. "The process may be used in other industries; for example, to recover potassium from the waste of sugar refineries."

From further investigations, Mr. Garrett has determined:

1. That calcium and magnesium can be completely removed from tap water in which they occur.
2. That iron can be removed from the water by passing through sodium permutit in the presence of air.
3. That the normal rate of flow (33 gals. per hour) can be nearly doubled without affecting the quality of the filtrate.
4. That the filter can be completely regenerated.
5. That there is a small loss of permutit in washing the filter. However, this loss is purely mechanical and by exercising a little care in flushing can be reduced to a minimum.

Although there has been, up to the present time, very little investigation of permutit, however, the results obtained both in this country and abroad all show the high efficiency and low cost of treatment of this method of water purification and point toward a large industrial application of the process in the future.

THE PRICE OF WAR.

While English exporters are striving to live up to the motto "Business as usual," all reports indicate that the paralysis of Germany's overseas trade is complete.

German manufacturers, who have travellers all over the world, cannot execute orders or fulfil contracts. Thousands of customers for German woollen goods, chemicals, hardware, machinery, and silk and fancy goods in the British Colonies and in South America cannot now obtain supplies.

The commercial campaign which Germany inaugurated a few months ago in overseas markets has, therefore, ended in a fiasco.

The war leaves England and the United States the only competitors in the field, and the longer the struggle lasts the more complete must be the wreckage of Germany's hopes of industrial expansion.

In the Far East and in India she is also threatened with severe losses.

"One of the German trades that will be hit very hard indeed," said the manager of Messrs. Raphael Tuck and Sons to-day, "is printing. The value of Germany's trade with India and China in lithographic and color printing is enormous.

"She prints postcards and posters for both countries by the ton, and has been able to undersell English competitors.

"Our own representatives have been brought face to face with German competition in all parts of the East, so that I can speak with authority upon it.

"In India there has been a big demand for cheap German prints, especially pictures of Buddha, but one consequence of the war will be that these pictures in future will be purchased in England."

UNITED STATES NOTES

Special to Pulp and Paper Magazine.

A negotiation was made last week at Watertown, N.Y., whereby the control of the St. Regis Paper Co. was transferred to G. H. P. Gould, the president of the company. The 4,607 shares of D. M. Anderson, general manager, were assigned to Mr. Gould, who, with George C. Sherman, now control the interests in the company. Just how much money was involved in the transaction has not as yet been announced.

The shares of stock held by Mr. Anderson were both preferred and common. The preferred stock has always sold at about par, while the last sales of the common brought fifty. It is not known whether Mr. Anderson contemplates retiring from active business, and he is on an automobile trip at the present time, so could not be seen. He still retains his interests in the Tappan Paper Company.

The St. Regis Paper Company owns mills at Deferietts, Herrings and Black River. The one at Deferietts is a four-machine plant with a capacity of about one hundred and twenty tons daily.

The mills at Black River and Herrings were purchased only a short time ago from the Jefferson Power Company. Paraffine paper is made at the Black River mill and wrapping paper at the Herrings mill. Each has a capacity of twenty tons daily. The company also has very valuable timber holdings in the Adirondacks, with a valuable asset in excellent water power.

The St. Regis Paper Company was organized about fifteen years ago. G. H. P. Gould, of Lyons Falls, has been president of the company; George C. Sherman, of this city, treasurer, and D. M. Anderson, general manager. Mr. Gould is also heavily interested in holdings at Donnacona, below Quebec, and in the Gould Paper Company at Lyons Falls.

Until this deal was executed, Mr. Anderson and Mr. Sherman were the two heaviest stockholders in the St. Regis Paper Company, owning over one-half the total number of shares. While no final action has been taken in the matter of a general manager of the St. Regis company, it is believed that J. Victor Baron, who has been assistant general manager for some time, will be appointed in Mr. Anderson's place.

Paper manufacturers in the vicinity of Portland, Me., had an opportunity of seeing during the past fortnight the travelling exhibition of paper sent out by the Department of State at Washington. The exhibition has collected by the department after consulting its considerate officers everywhere in regard to the paper business in their respective localities with a view to determining what kinds of paper are used, and what sizes are not used, and what opportunities exist for American manufacturers to fill in the gaps. With the reports were sent a large number of samples, and these have been arranged as an exhibit. There are more than two samples of all kinds and styles of paper used for every purpose and made in all sorts of

Naylor is secretary, held a meeting in the Hotel Kimball, in Springfield, Mass., several weeks ago, there being twenty-seven concerns represented. The certainty of the future supply of imported raw materials, and the demand on the part of some jobbers to have large future orders immediately filled at present prices, led to this meeting to consider the state of trade, and resulted in a withdrawal for the time-being as a natural measure of safety, of the present price-schedules. Under this decision, prices will be governed by current conditions. It is not contemplated that any marked advance will immediately take place; but the effect of the European war will be watched closely, and prices must determine themselves by events as they materialize.

* * * *

Under a decree of foreclosure entered recently at the federal building in Madison, Wis., the property of the Brunet Falls Manufacturing Company, located at Cornell, Wis., was sold August 10 at public auction, the sale taking place at Chippewa Falls, the county seat in which the village of Cornell is located. The property was purchased by the Cornell Woods Products Company, which is a reorganization of the defunct Brunet Falls Manufacturing Company. It was bid in at \$1,500,000. Frank H. Jones, trustee under bonds, was the plaintiff, and George C. Holmes served as special master at the sale. Chauncey O. Frisbie, of Cornell, who was appointed receiver some months ago, will be manager of the plant, which will continue the manufacture of wood pulp materials.

* * * *

The Economic Power and Products Company, Philadelphia, is in receipt of many letters from boards of trade, chambers of commerce, etc., of various cities in the cotton belt requesting that it locate its first mill in their respective cities, many of them offering attractive inducements, including free sites, exemption from taxes, etc. A committee of the company will go south in the near future to look over some of these locations and decide which is the best adapted to their requirements.

* * * *

The Albany Paper Company, paper manufacturers of Albany, N.Y., has been taken over by the Albany Paper Products Company, which was recently organized. The officers of the new company are J. S. Cline, president, A. M. Shepard, Vice-President, J. A. Fletcher, superintendent of the Albany Paper Company, will remain with the new concern in the capacity of superintendent. J. S. Cline, president of the newly incorporated company, is a member of the firm of J. S. Cline and Co., 19 South LaSalle Street, Chicago, and it is stated that it is the plan to remodel the mill at Albany, and in addition to install a box and carton plant to provide facilities for conducting the business of the Fletcher and Federal Paper Box Companies, thereby effecting a combination of three concerns.

It is understood that the consummation of the deal is due to the efforts of C. A. Chapman, president of C. A. Chapman, Inc., the paper mill engineers of Chicago.

The Writing Paper Manufacturers' Association, of
Chicago, A. Crocker is president and Emmet Hay

Advices from California state that the Northern part of the state will shortly have one of the largest mills in the West, and the bark and waste wood of the redwoods is to be used in manufacturing all the various kinds and qualities of paper. Articles of incorporation of the Redwood Paper and Pulp Company have been filed with the Secretary of State, with George Hasman, George P. Brown and Walter C. Ives as the incorporators. The principal place of business is to be in Eureka, Humboldt county, the redwood center of Northern California. The capital stock is fixed at \$500,000, part of which is actually subscribed.

In recent years experiments have been made with the redwood waste and especially the bark of the gigantic sequoia, which were satisfactory and indicated that at small expense the great slabs of wood now destroyed annually in the logging camps could be utilized in manufacturing a cheaper and better grade of paper for all commercial purposes.

An important change has been made in the method of operating the Franklin, N.H., plant of the International Paper Company. Superintendent George M. Dunham has taken full charge of the plant to manage every detail. Heretofore much of the business of the mills, including many minor details, have been supervised by the New York office in conformity with the system by which the many mills of the corporation are managed throughout the country. The new scheme of a resident manager to handle the entire business of a plant is a sort of an experiment being tried for the first time at the Winnipeg mill. There is a belief that the scheme may be put in operation at other plants, if it works out satisfactorily.

The tale industry of northern New York is not expected to suffer on account of the shutting off of the exportations to Europe, but officials express the belief that prices will improve. The tale mines near Gouverneur, N.Y., have shipped large quantities abroad for use in the manufacture of paper there, but it is claimed that the increased demand for paper in this country will more than make up for the loss of the foreign trade. The mills are only shipping to South America now, but some hopes are held out that Great Britain will eventually be able to re-open the high class sales to international commerce.

The trustee of the Battle Island Paper Co. of Fulton, N.Y., have made arrangements for the sale of the large wood lands of the company in Eastern Canada, which for many years produced supply of pulp wood papers, transferring the properties to the Ontario Paper Company of Canada, will be executed shortly. The amount specified in the deal is \$300,000.

Charles N. Bulger one of the trustee, returned last week from Chicoutimi, where a meeting of the Canadian creditors of the Battle Island Paper Company was held, at which claims were filed and arrangements for the sale were made. The Supreme Court of Quebec will issue an order turning over the property to the Ontario Paper Company.

The sale will include 27,000 acres of wood lands owned outright by the Battle Island Company, 100,000 acres of Crown Limits lands controlled by the company, a rossing plant at Ha Ha Bay, and \$26,000 worth of pulpwood ready for shipment. For every cord of wood taken from the Crown Limits lands the Battle Island company was compelled to pay a tax of 65 cents to the Canadian Government.

The next step to be taken in the case is the disposition of the company's plant.

Mr. Bulger stated that at least \$800,000 should be realized from the State for the power rights. The trustees are also ready to dispose of the paper plant, the appraised value of which is \$400,000.

With the sale of the Canadian properties, after the claims have been paid, about \$165,000 will be left for the bondholders. There will also be the proceeds from the sale of the Battle Island plant together with whatever is obtained from the State for the destruction of the water power. The outstanding bonds of the company amount to \$500,000.

On Tuesday and Wednesday of last week the domestic sulphite manufacturers held a meeting in the rooms of the American Paper and Pulp Association in 18 East 41st New York. The general feeling among manufacturers was against taking advantage of the present wood pulp shortage. Conservative advances of from five to ten per cent were said to have been made. Spot orders for unbleached sulphite could probably be satisfied at prices ranging from \$39 to \$43 a ton at the mill. No contracts will be made at any price. The feeling among manufacturers is that no one is willing to load up at these figures, as they would prefer to wait a settling condition.

The Commercial Envelope and Box Company of Binghamton, N.Y., which was recently partially destroyed by fire, has re-opened, and a force of more than 75 employees have been put back to work. The entire interior of the factory has been repaired, new machinery has been installed and new floors laid. The interior construction has been reinforced by steel and new timber.

In about two weeks it is expected that the new paper making machine being erected in the plant of the Northern Paper Mills of this city will be ready to operate, and will be turning out paper about September 1. There has been a short delay in getting the big machine erected. It was expected that it might be running this week. Other smaller machines, such as rewinding machines, and printing presses, have been installed in the finishing department of the building just completed. The big addition is ready to use now. Just as soon as the new machine is set in motion and paper is manufactured, the equipment for finishing the product will be made use of by the company.

The lower mill of the Crane Brother's Paper Company in Westfield, Mass., is running on a four days a week schedule for the remainder of the month. One hundred employees are affected by the change, which is expected to be of short duration.

The State Commissioner of Corporations has granted a charter to the Inland Paper Company of Adams, Mass., to engage in the paper business. The capital stock of the new corporation is placed at \$40,000, represented by 150 shares of preferred and 250 shares of common stock, each share having a par value of \$100. Henry L. Harrington of Adams is the president of the corporation, William W. Chatterton of Chicago vice-president and Francis R. Harrington of Adams is treasurer. These three men form the board of directors of the corporation.

BELGO DEVELOPMENTS.

The photographs below give practically a panoramic view of the construction at the Belgo-Canadian works at Shawinigan Falls. Between the right hand side of the upper view and the left-hand side of the lower, a

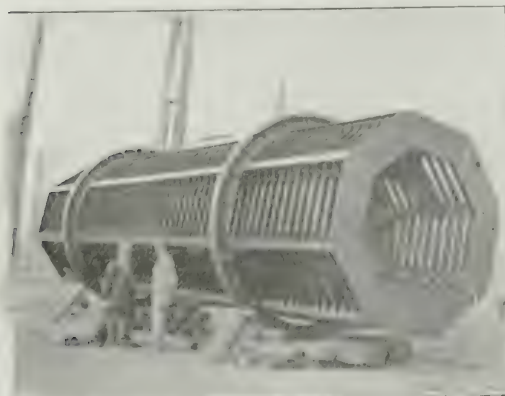


narrow hill occurs. In the pictures from left to right may be seen the old machine room, wood room, new machine room, new sulphite plant (behind) new screen room machine shop and administration offices,



conveyor from slasher mill in foreground, wood stack and conveyor, at right angles to one shown above.

The third picture is of the new 40-foot barking drum which is to be installed. Inside the drum, which con-



sists of four narrow parts coated to the steel frame, may be seen the work things which directs the sticks from one pul to the other.

ENGLAND AND WOOD PULP.

Improved Forestry Might Save Her \$180,000,000 Yearly.

The huge sum of \$180,000,000 annually is what the report of the State Forestry Branches says can be saved in England if only the forests were properly developed and their products turned into wood pulp. It is known that there are very large areas of uncultivated land which would produce better results financially from the growth of timber than from the present methods of utilization. The total value of timber and wood pulp imported into the United Kingdom in 1912 was over \$180,000,000, of which certainly more than 80 per cent was derived from coniferous timber, or pine trees.

This, continues the report, is precisely the type of timber for the growth of which the waste land of the country is best adapted. Moreover, with regard to the settlement of a larger population on the soil, in a grazing estate the amount of employment is increased by about 60 per cent on beginning afforestation operations. The report says in conclusion:

"Gradually as the plantations fall to be thinned and the produce converted the increase must become much greater. The total area of woodlands in England and Wales is 1,884,000 acres. Over 95 per cent of this is privately owned, and it is probably producing not more than one-half its maximum yield. It is not possible to make an accurate estimate of the value of this property, but a conservative estimate would be between £25,000,000 and £30,000,000. The improvement of existing woodlands is an important matter. If it were possible to raise the production by even 10 per cent an effect equivalent to the afforestation of at least 130,000 acres would be obtained.

"Aside from the fact that timber is likely always to be considered the most suitable material for most of the purposes to which it is now put, recent years have seen it adapted for a number of new purposes. The wood pulp industry is still capable of extensive development in this country, and it may be anticipated that wood will be still more largely used for the purpose of paving."

BELGO'S MACHINE DELAYED.

It is rumored that progress in construction at the plant of the Belgo-Canadian Company at Shawinigan Falls has been interrupted by the war, through the action of the British Government in taking over the Walmesley works in England for cannon-making. The big 202-inch machine which was being rushed to completion has been side-tracked, it is understood, for eighteen months. In this case, Belgo will not go ahead with the new sulphite plant, of which one digester shell has been practically completed, and the other is well under way. Mr. Biermans, the manager, went to Belgium a little over a month ago, and considerable anxiety is felt, as he has not been heard of since. It is quite possible that he is in the thick of hostilities. It is not known just when advance will be made with the plant. Mr. Statler, the chief engineer, is working incessantly to keep things moving properly under the altered conditions.

George H. Millen, of the E. B. Eddy Co., Hull, spent a few days recently in a motor tour of Ontario visiting the agencies of the company in Toronto, Hamilton, London and Windsor.



BRITISH TRADE NEWS

SPECIAL TO PULP & PAPER MAGAZINE



The European war has placed many of the British paper mills in difficulties, but up to the present there is no fear of a paper famine setting in, as there is a fair supply of pulps on hand. The Lancashire mills are about the worst off, so much so that one concern had to pay \$18 for a ton of ground wood. These mills in Lancashire are hoping that Canada will put pulps on the market, but many of the managers believe that the Dominion producers are finding it difficult enough to keep up the supplies for the domestic and States consumption. The Strathmore paper mill in Kent, which is owned by Edward Lloyd, Ltd., has lost close on to 100 men who have joined the reserve, territorial and naval forces. Provision is being made for the families by Mr. R. D. Hall, the manager, by direction of the main association, others in a patriotic way. Though the mills in Scotland have still a supply of *Esparto* grass on which they are greatly to be relied upon in the near future, there will be difficulties in replenishing the supplies as the German merchants have been hoarding goods which *esparto* is shipped from, and thus there already exists a serious seeming reasonable freightage. *Esparto* prices have advanced by \$2 to \$4 a pound, but are fairly big and the pockets of papermakers. There is now some talk of increasing the prices of newspapers in England and the provinces, owing to the high cost of newsprint. A great deal will depend what the coal fire will be doing hereafter, but at present the outlook is gloomy. Some military men say the war may last 18 months or more longer.

The death of Mr. John G. Galloway (deceased). He was managing director of the Guard Bridge Paper Mill Co., Ltd., whose mill in Scotland has a world-wide reputation for the production of *esparto* papers. We learn that Mr. Galloway did not know about *esparto* or *esparto* paper production, was not worth knowing. He was 75 years of age and 45 years ago he joined the mill of the Guard Bridge Paper Co., the original capital of which was \$217,000. To-day the capital is valued at \$1,152,000. There are five machines in the mill, and the output is 250 tons of paper per week. Before Mr. Galloway died he had a scheme prepared to bring the mill more up-to-date, by installing electricity. This scheme consisted of six large turbines, having an output of 100 K.W., turbo-generators for generating the current to drive the mill, one of the turbines to stand by as it only requires one to supply the necessary electricity. The turbines are arranged with a by-pass for tapping the stream to be taken in the grass hedges for boiling purposes, and, also, for driving purposes, etc., but the stream not required passes on through the lower stages of the turbines and thence to a Messrs. Watson condenser. The pressure of the steam is turned off at 35 pounds.

Cartilagins must not lose sight of the supplies that will shortly occur in the British Dominions and Colonies for paper and pulp. Australia and New Zealand consume large supplies of newsprint, and so do the Indian possessions. I expect that the trade in paper boards are under revision in Australia at present and Mr. N. McIntosh, manager for Canadian

and Co., who are representatives of the Wayagamach Pulp and Paper Co., Three Rivers, Quebec, has applied for a preferential duty on kraft paper manufactured in Canada. He wants a duty the same as that enjoyed by the British mills, and no doubt he will get it. Paper manufacturers or pulp men who want information on tariffs or information as to how they may extend their business in the colonies of Great Britain should not hesitate to consult the Pulp and Paper Association of Canada, who in turn should be able to obtain the necessary details from the Colonial Office in London, through the Dominion Government. Tariffs want watching too, and so do the openings in the various markets.

A large representative company of newspaper owners, shippers, and paper men met at the Donside Paper Mills this morning to inaugurate the starting up of a new fast running paper machine, which has been built by Charles Walpole and Co. Ltd. The machine is 124 inches wide and runs at newsprint production at the rate of 600 feet per minute. It is housed in a building measuring 500 feet in length by 60 feet in breadth. Attached to this machine room is another room 200 feet in length by 40 feet, which is used as a store for paper and also as a heater room 60 x 62 feet.

The eighteenth annual meeting of A. M. Peckles and Son, Ltd., was held in London, Mr. George J. Maddock presiding, at the Hotel. It was reported that owing to the continued serious increase in the cost of producing paper, together with also troubles at the mills, the profits had been seriously affected during the past year. The gross profit is only £120. Adding the sum of £1,158 brought forward, there is a total of £1,287, which is to be carried to the next account. No other dividend is to be paid off this year, with provisions for future years, which on the last occasion concerned 2½ per cent, bringing the interest up to December 31, 1912. The president, in his address, said coal had not dropped two cents a ton, and then they had to contend with the failure of Huxson and Co., who were under contract to supply the company with over 11,000 tons of *esparto* grass. The price of grass jumped in one single day \$1.50 per ton and cost them more than a small shortage.

The government returns, issued by the Trade Board, show an increase in the imports of paper and boards and cards during July and a decrease in the exports of the same materials from British mills, the figures are:

Imports, July			
1913.	1913.	1914.	1914
Cwts.	Cwts.	Cwts.	Cwts.
1,207,370	706,292	1,264,614	739,730
Imports, January to July			
1913.	1913.	1914.	1914
Cwts.	Cwts.	Cwts.	Cwts.
7,406,070	4,392,925	7,291,357	4,406,513

No particulars of Canadian plants are given. Still Newfoundland shipped 243,725 cwt. of printing paper on reels in reels, compared with 141,867 cwt. in July 1913, or a total of 577,848 cwt. for seven months as against 542,895 cwt. in 1913. Supplies of coal are

colated papers from the States also show very substantial increase in July.

The exports of paper from the British mills are again down. In fact they have never recovered practically since September last and it will be some months yet before a satisfactory return is shown. The figures for July are:

Exports in July.			
1913.	1913.	1914.	1914.
Cwts.	£	Cwts.	£
333,365	334,433	275,363	279,928
Exports—January to July.			
1913.	1913.	1914.	1914.
Cwts.	£	Cwts.	£
2,108,986	2,223,261	1,979,316	2,032,378

These figures show the low state the British mills are in. To Canada, writing paper was exported to the extent of 274 cwts., compared with 511 cwts. in July 1913. The total for the seven months is 2,321 cwts. as against 3,904 cwts. in 1913. Canada took 5,486 cwts. of printing paper, compared with 12,180 cwts. in July, 1913. The seven months' total being 52,876 cwts., as against 80,122 cwts. in 1913. These papers are mostly of high-class. Exports to the States also decreased.

The imports of wood pulp in July into the United Kingdom from all countries were as follows compared with the corresponding periods in 1913:

Imports in July.			
	1913.	Tons.	1914.
Chemical Bleached Dry.....	1,363		1,341
Unbleached dry.....	29,693		33,543
Chemical wet.....	370		2,317
Mechanical dry.....	709		1,038
Mechanical wet.....	51,153		69,647

Imports—January to July.			
	1913.	Tons.	1914.
Chemical Bleached, dry.....	12,095		8,135
Unbleached, dry.....	187,775		183,902
Chemical wet.....	9,243		9,469
Mechanical dry.....	4,766		3,156
Mechanical wet.....	301,867		300,015

The reports of mechanical wet or ground wood pulp is detailed as follows: From Canada 17,870 tons compared with 2,481 tons in July 1913, or a total of 41,293 tons from January to July, as against 29,116 tons in 1913. Norway, 25,564 tons compared with 24,910 tons in July 1913, or a total of 182,534 tons for seven months as against 198,019 tons in 1913. Sweden 13,976 tons compared with 16,569 tons, or a total of 26,273 tons compared with 38,964 tons for the seven months in 1913. The grand total is 107,886 tons in July, an increase of 64,395 tons over July 1913. It will be seen from these figures that the supply of pulp from the Dominion is gradually increasing, and, therefore, the market in the United Kingdom should be supplied very carefully in order to capture more of the contracts for the usually of 3 and 5 years duration.

J. E. Donachie is in charge of the Toronto office of the Canadian Paper Co., succeeding A. Donachie, who has resigned. Mr. Donachie has been on the senior staff for some time and was formerly employed with the P. & B. Co., Toronto.

HENRY D. EDDY.

The sudden death of Henry D. Eddy, a former well known Kalamazoo paper manufacturer, but more recently the president and general manager of the Morris Fibre Board Company, Morris, Illinois, in the Grand Pacific Hotel in Chicago, on Friday, August 7, proved a great surprise to his friends and associates in Kalamazoo. Mr. Eddy, who was only 39 years old, had been in fairly good health, but when found in his room at Chicago, there was every indication that he had taken an overdose of medicine. He was dead when attendants at the hotel reached his bedside.

Mr. Eddy was born in Kalamazoo and after attending the public schools for a time, became an employe of George Bardeen, the well known Otsego paper manufacturer. He showed remarkable ability in the paper business, and soon became regarded as one of the best paper makers in this part of the State. After serving a number of years with Mr. Bardeen, he came to Kalamazoo and entered the services of the Bryant Paper Company. He remained with the Bryant Company until a few years ago when he was made treasurer and became one of the owners of the Eddy Paper Company at Three Rivers, Michigan. Previous to his advent in Three Rivers, the company was known as the Three Rivers Paper Company. Under Mr. Eddy's personal management it rapidly increased its business and the company soon took over the mill at White Pigeon, Michigan, located but a short distance from Three Rivers. Mr. Eddy managed both of the mills most successfully.

About a year ago he became interested in the Morris Fibre Board Paper Company of Morris, Illinois, and moved to that place, resigning as manager of the Three Rivers company, although retaining his financial interests in the company. It is reported that the venture in Illinois, was proving an exceptionally good one under his management. Mrs. Eddy survives. There are no children. At this time no plans have been announced for the funeral.

WILLIAM J. M'CAFFREY.

William J. M'Caaffrey, Treasurer and Manager of the Lake Champlain Pulp and Paper Company passed away on Sunday, the 23rd instant in the Presbyterian Hospital, New York City. The trouble was hardening of the arteries and he died of angina pectoris. In his demise the pulp and paper industry of the Eastern States loses a staunch and respected member.

TO RELIEVE DISTRESS.

There is a proposal afoot in Canada to have the Governments of Ontario and Quebec engage those who may be forced out of employment during the coming winter as land clearers in the northern parts of the two provinces. In this way distress would be relieved in the cities, agricultural areas would be opened up, and pulp wood would be provided for manufacturers.

PROGRESS MEETING.

The East Canada Pulp and Paper Company bondholders will meet on the last day of August to decide what shall be done to protect and further their interests. This meeting will have had before it all the affairs of the company since its inception in 1910.



NEW PATENTS



PAPER-WINDING MECHANISM.

Samuel M. Langston, Camden, New Jersey, Patented
July 28, 1914, in the United States Patent
Office.

This invention relates to certain improvements in winding mechanism for sheet material and more particularly to that type in which the roll upon which the paper or other sheet material is being wound is supported between parallel rollers so that the axis of the roll may move as the diameter of the roll increases.

In a common type of winding mechanism of this character it is customary to provide two parallel supporting rollers and a pressure roller above the roll of material and pressing the latter down upon the two supporting drums or cylinders.

My invention relates particularly to the means for controlling the operation of this pressure roller, and one object is to insure the maintenance of the desired parallel relationship of the pressure roller and the two supporting rollers so that if a comparatively narrow strip of paper is being wound, the pressure roller will act equally at each end of the roll of paper even though the latter be closely adjacent to one end of the winding mechanism.

In order to wind the paper sufficiently tight and form the roll of the desired hardness it is necessary that the pressure roller exert a considerable force upon the roll of paper and another object of my invention is to permit the accomplishment of this result without the necessity for employing a pressure roller of great mass.

It often happens that the paper along one edge portion will run slightly thinner than at the opposite edge, so that the roll will not wind as tightly at the end where the paper is thinner as at the other. To overcome this I so mount the pressure roller that during the winding operation the opposite ends of the pressure roller will rise simultaneously and to the same extent, the roller moving in parallelism, but provide means whereby one end of the roller may be slightly raised or lowered in respect to the other so as to insure the application of uniform pressure at opposite ends of the roll of paper being wound.

Other objects and advantages of my improved construction will be pointed out hereinafter and the novel features defined in the claims.

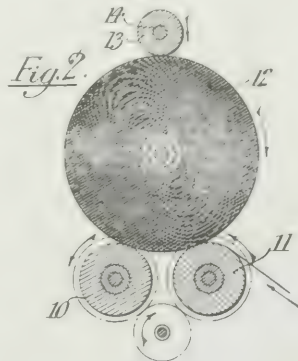
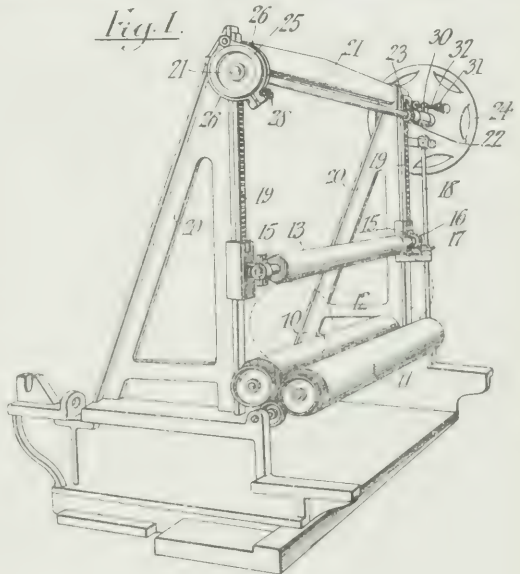
Reference is had to the accompanying drawing forming a part of this specification, and in which similar reference characters indicate corresponding parts throughout the several views.

Figure 1 is a perspective view of the upper portion of a machine embodying my invention; Fig. 2 is a transverse section showing relationship of rollers and paper roll; Fig. 3 is a vertical, longitudinal section through the mechanism illustrated in Fig. 1; Fig. 4 is an enlarged end view of the upper part of the machine; Fig. 5 is a transverse section on the line 5-5 of Fig. 3; and Fig. 6 is a sectional detail corresponding to Fig. 5, but showing a slightly modified adjusting mechanism.

My invention is applicable to slitters and rewinders of the general type shown in previous Patents 1,009,756 and 1,009,757, although it may be utilized where it is desired merely to rewind the paper without slitting or with merely a trimming of the edges of the paper. The

principle of operation whereby the paper is wound on the roll with the desired degree of hardness is substantially the same as that employed in my two previous patents, above referred to, and therefore, it is not thought necessary to illustrate or describe this part of the machine except in a general way.

In the machine illustrated there are employed two substantially parallel cylinders or friction rollers 10



and 11, mounted to rotate in the same direction and at the same speed and to support the roll 12 upon which the paper is being wound. Above these friction rollers is a pressure roller 13 mounted to move vertically on suitable guides as the roll of paper 12 increases in size and uses.

My invention as previously stated relates particularly to the means for controlling the operation of the

PROCESS OF MAKING BISULPHITE OF SODA.

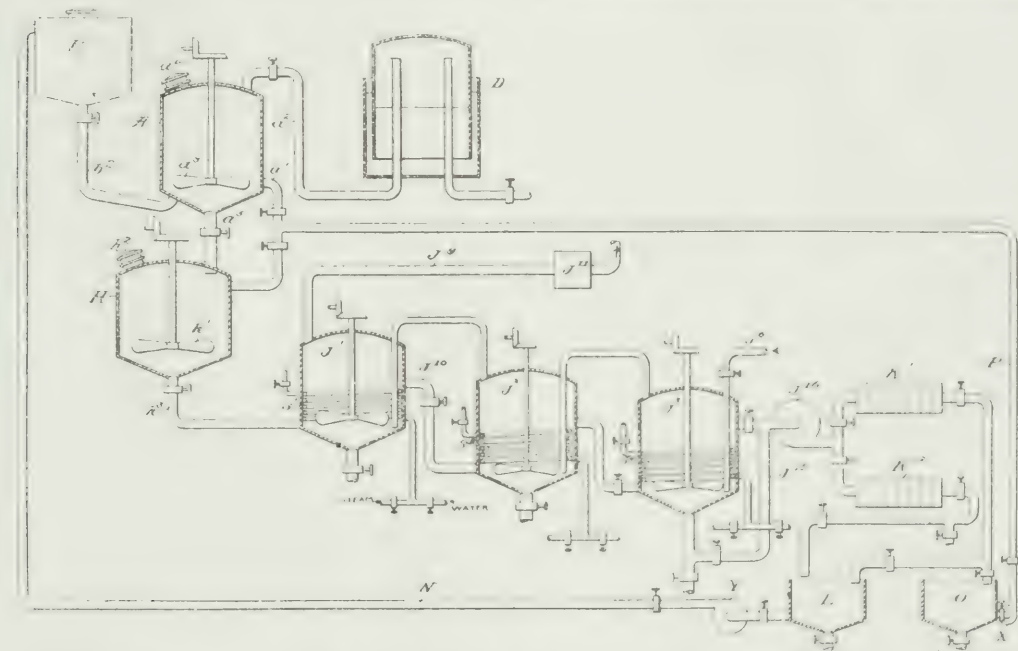
HENRY HOWARD, Boston, Mass., Patentee—Patented July 28, 1914, in United States Patent Office.

This invention relates to a process for making bisulphite of soda from sulphur dioxide, ordinary salt cake, or a sulphate of soda, and either calcium hydroxide or calcium carbonate. The precipitated calcium carbonate known as "lime mud," a by-product in the manufacture of caustic soda from carbonate of soda, is a useful material in this process and also gives off carbon dioxide which is collected.

In the accompanying drawing, the process is represented diagrammatically.

When calcium carbonate, "lime mud," is used, a suitable quantity suspended in water is added to tank A through its manhole a^1 , and kept in suspension by the stirrer a^2 . Water may be added to this tank through pipe a^3 . Into the bottom of this agitated mix-

operation is added through pipe P^2 . The thoroughly mixed solutions of sodium sulphite and sodium sulphate with calcium sulphate in suspension are now run through the valved pipe h into the first of a series of closed converting tanks of which three, J^1 , J^2 , J^3 , are shown in the drawing, each containing a coiled pipe S , S^1 , S^2 through which steam or water may circulate to control the temperature of the solutions in the tanks. Each tank further contains a stirrer to keep the contents well stirred. The mixed solution of sulphite and sulphate of soda with calcium sulphite enters the bottom of the first tank J^1 from h^2 and runs out at the top of the first tank J^1 from h and runs out at the upper part through pipe J^{10} , leaving a gas space above; from there it enters tank J^2 at the bottom, leaving at the upper part, and enters at the bottom of tank J^3 , leaving at the upper part, or through by-pass J^{15} to pump J^{16} , and then to the filter-presses K^1 - K^2 . A stream of sulphur dioxide, such as burner gas, passes through



ture is run a solution of sodium bisulphite through pipe h from tank B, from a prior operation, or any other source, in such quantity that the calcium carbonate will be decomposed, forming calcium sulphite, sodium sulphite, and carbon dioxide, the latter passing out through pipe a^3 into tank D. The sodium bisulphite is run into the bottom of the calcium carbonate in order that the carbon dioxide collected may not be contaminated with sulphur dioxide, which would be the case if the sodium bisulphite was run into the top of the calcium carbonate or lime mud. After this reaction is completed, the mixed calcium sulphite and sodium sulphite is run through the valved pipe a^2 into the sulphate tank H, wherein it is constantly stirred by the stirrer h^1 . To this solution is added sufficient salt cake, or sulphate of soda, through the manhole h^2 , to subsequently precipitate the calcium as sulphate of calcium, and water or wash-water from a subsequent

operation is added through pipe P^2 . The thoroughly mixed solutions of sodium sulphite and sodium sulphate with calcium sulphate in suspension are now run through the valved pipe h into the first of a series of closed converting tanks of which three, J^1 , J^2 , J^3 , are shown in the drawing, each containing a coiled pipe S , S^1 , S^2 through which steam or water may circulate to control the temperature of the solutions in the tanks. Each tank further contains a stirrer to keep the contents well stirred. The mixed solution of sulphite and sulphate of soda with calcium sulphite enters the bottom of the first tank J^1 from h^2 and runs out at the top of the first tank J^1 from h and runs out at the upper part through pipe J^{10} , leaving a gas space above; from there it enters tank J^2 at the bottom, leaving at the upper part, and enters at the bottom of tank J^3 , leaving at the upper part, or through by-pass J^{15} to pump J^{16} , and then to the filter-presses K^1 - K^2 . A stream of sulphur dioxide, such as burner gas, passes through

bines with the sulphur dioxide and water present to form sodium bisulphite, the mixed solutions being constantly stirred, as above noted; the several reactions are completed when the solutions leave tank J². The sodium bisulphite and calcium sulphate are now pumped into the filter-presses K¹, K², one being used while the other is being cleaned; when passing through filter K¹, the outlet valves are so arranged that the finished liquor, sodium bisulphite, runs into storage tank L; as soon as the filter is filled with the precipitate of calcium sulphate, the valves are changed, the mixed solution of sodium bisulphite and sulphate of calcium is passed into filter K², and its finished solution, sodium bisulphite, passes into the storage tank. Filter K¹ is now washed and cleaned, the wash-water run into tank O, from which it may be pumped by pump X into the sulphate tank II through pipe P, or into tank A, when desired. A portion of the bisulphite solution in tank L is pumped by pump Y through pipe N into the tank B for a subsequent operation as above noted.

With the above method, the carbon dioxide in the "lime-mud" or other carbonate is recovered; if, however, its recovery is not desired, the lime-mud or other carbonate is mixed with its molecular equivalent of salt-cake or sodium sulphate and water, in tank II; the mass is now run into the converting tanks J¹, J², J, and treated with burner gas, care being taken to maintain the temperature between 45 deg. C. and 65 deg. C., as above described. The reaction between the lime-mud, sodium sulphate and sulphur dioxide forms calcium sulphate, sodium sulphite, and carbon dioxide, the latter passing into the atmosphere through pipe J³. The sodium sulphite combines with more sulphur dioxide forming sodium bisulphite, and the mass of bisulphite and calcium sulphate is now pumped into the filter presses, as described.

When calcium hydroxide is used, it is run direct into tank II, water being present to keep the hydroxide suspended, and stirred; the molecular equivalent of salt-cake, or sodium sulphate is added thereto so that all the calcium hydroxide and sulphuric acid will combine to form calcium sulphate and water. The thoroughly mixed and agitated mass is then run into the series of converting tanks; from now on the process is the same as with the lime-mud, except that the temperature-limits may be greater. Other alkaline bisulphites may also be made by this process.

ABITIBI PROGRESSES.

The excavation for the new sulphite mill and the new news print mill of the Abitibi Power and Paper Co. at Frénois Falls, Ont., has been completed, and the work on the foundation of the news print mill is going ahead rapidly. The company is busy shipping out ground wood pulp from eight to ten cars being sent out every day.

In the raising of over half a million dollars for the Toronto and York County Patriotic Fund there were really generous contributions from paper houses, pulp mills, printers and others. The Provincial Paper Mills Co. donated one thousand dollars, Brown Bros., Limited, one thousand; Warwick Bros. and Rutter, one thousand; Copp, Clark Co. one thousand; W. J. Gage Co. one thousand; Southern Press, five hundred; Publishers Association of Canada three hundred; Miller and Richmond two hundred and fifty; W. P. Ryan, Rogers Co. of America, two hundred; and others. W. P. Gandy of the W. J. Gage Co. was one of the most active workers on the organization.

SPANISH RIVER BUSY.

John G. Sutherland, sales manager of the Spanish River Pulp and Paper Co., who now makes his headquarters in Dayton, Ohio, is spending a few days in Toronto. Mr. Sutherland travels all over the continent, and there is no one more conversant with the news situation at the present time. He stated: "We are now making at the Soo, Espanola and Sturgeon Falls about four hundred and thirty-five tons per day and are running to the utmost capacity. We have withdrawn all quotations, and are not making any. Any business placed is on an individual arrangement. We are not taking on any new business at present and are looking after our customers, protecting them in every way. We have no ground wood or sulphite pulp for sale as we use all that we produce. I think there will be a shortage of news print in America about the first of the year, as about seventy-five per cent of the contracts now in force between newspaper publishers and the mills expire between now and the first of March next. Our company is doing no export business at all, although we have received inquiries from all parts of the world. The news mills should have three or four good years if they do not increase prices unduly, and safeguard their customers. I may say that our water conditions, since the recent rains, are first class, and we are going to send a large number of men to the woods to get out pulp wood. We have started already, and the number will be increased during the next few months. Operations with us will be on as large a scale as in other years."

Mr. Sutherland, who has been over the whole Western States, says that all paper mills are busy and that many, who were making wrapping and manila products have turned their machines onto news in order to help out in the demand. T. H. Watson, who is now President of the Canada Machinery Corporation with headquarters at Galt, Ont., recently resigned his position as Vice-President and Director of the Spanish River Co. and has been succeeded as a director by Percy Wilson of Sault Ste. Marie. The company has now only one vice-president, George H. Meade, who resides in Dayton, Ohio. W. N. Hurlburt, formerly of the Toronto office of the company, which was closed some months ago, and removed to Sault Ste. Marie, has been made assistant to C. H. L. Jones, who is manager of the operating departments and assistant to W. E. Stavert, of Sault Ste. Marie, President of the company.

TO OPEN UP NEW PULP DISTRICTS.

Preparations have been completed by the Quebec Government to open new districts to the lumber and pulp industries. During August and September, limits to the Abitibi and Lake St. John districts will be auctioned off. In the Lake St. John region the territory to be opened is north of the lake and in the basin of the Mistassini and Rat Rivers. In the Abitibi district it is situated south of the Transcontinental, but on the north slope in the basin which empties into James' Bay. The tract is traversed by the Poisson Blanc, Harricana and Bella Rivers. Both limits have been carefully surveyed by the forestry service.

Advertisements are gradually reappearing in the London papers. Manufacturers perceive that whatever the length of the war, the normal demands of society must go on to an extent which will warrant active working up of business. The newspapers are increasing their size.

REVIVAL OF THE UNITED STATES CHINA-CLAY INDUSTRY.

The development of the china-clay industry in the United States, says Mr. Consul-General Wilfred Powell, is expected to progress more rapidly as a result of the advance in price of British clay. Before the Wilson Bill passed 18 years ago, put china-clay on the free list, the duty was about £1 a ton. At that time American clay was by no means in strong demand among the potters, who found fault with the careless washing and preparation, but producers were improving their process; and when duty-free clay was passed it put them practically out of business with the exception of one field known as the Brandywine Summit in the State of Delaware. The Payne-Aldrich Bill placed a duty on china-clay of 5s per ton, and quarrying of clay again took on an industrial aspect. There were brought from the United Kingdom in 1913 278,276 tons of white china-clay at an invoice value of about £325,821. Under the Underwood tariff china-clay will come in free again, and already the British producers have advanced the price. It may be recalled that when the Wilson Bill passed in 1895, and put clay on the free list, the price in Europe went up about 8s a ton.

At present foreign china-clay laid down in Trenton, the principal centre of pottery works in the States, cost about £2 12s 1d a ton. American clay, it is stated, can be delivered at a lower cost, and as producers are conforming to the proper idea of washing and preparation it is predicted that the producing of white china-clay is likely to become an industry of some magnitude.

This concession will call for the development of the water powers in the districts, and will carry the obligation to construct pulp mills of a specified capacity within three years.

The new plant of the Beaver Board Companies at Thorold, Ont., is about completed and, it is understood, that the mill will be running in the near future.

FEED-WATER DIFFICULTIES AND THE VALUE OF THE CHEMIST.

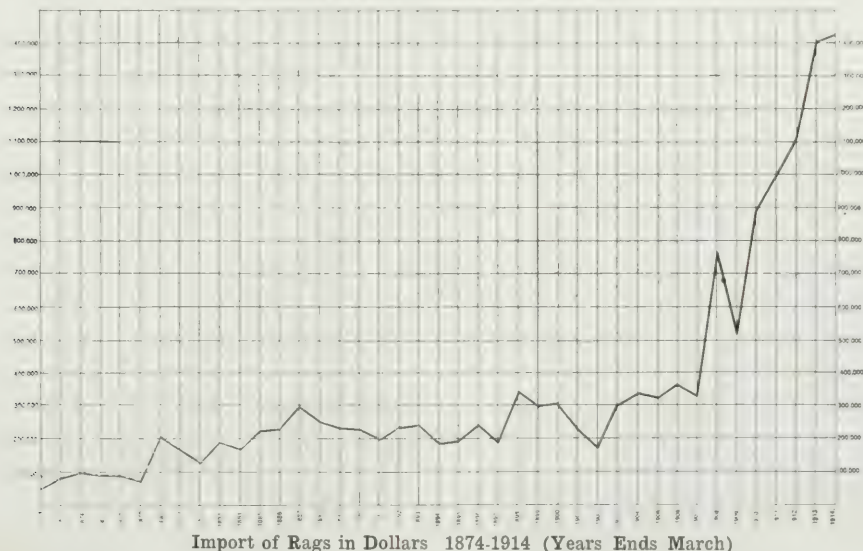
The problem of suitable feed-water is still a trouble-maker in many plants. The formation of scale and the softening of water are due to the simplest of chemical reactions, and by an analysis of the water a competent chemist can readily predict in advance the proper amounts of suitable chemicals necessary to prevent scale or corrosion, and not only save the company the expense of frequent boring and replacing of tubes, but obviate the necessity of attempting to force heat through the same substance with which many of your steam lines are insulated. The services of a chemist, said Mr. Carl F. Woods, secretary of the firm of Arthur D. Little, Inc., of Boston, when recently speaking before a group of street railway operators, would prevent the purchase of a special compound at \$1,000 a year, which consisted of 97 per cent water and 3 per cent molasses, or obviate the necessity of purchasing a mixture of soda ash, tanning, and water under a brand name at 8c a pound, when the principal ingredient can be obtained for 1c a pound.

MANUFACTURE OF LEATHER BOARD

Most leather boards are understood to have a relatively small proportion of leather (for instance, 15 to 20 per cent) in their composition. The balance is composed of brown pulp and old paper of good quality. In some mills, instead of placing the leather cuttings in clean water, they are immersed directly in the vats with milk of lime, where they are left as long as two months, according to the quality desired. This class of board is often made on ordinary rolling machines.

In order to produce a board resembling leather and fit to use in soles, it should be passed several times through the sheeting machine. Frequently, however, a thin sheet of real leather is pasted on a sheet of leather board. Most leather board sold does not contain any leather—fish glue, gelatine, wax or other substances being added to give compactness and wearing qualities.

CANADA'S PULP AND PAPER TRADE



PULP AND PAPER NEWS

The George Irish Paper Co., of Buffalo, N.Y., have opened out in Toronto under the name of the Monarch Paper Co. The representative of the company is E. A. Conway with office at 118 Sun Life Building. It is expected that stock will be carried in Toronto in the near future. The Monarch Paper Co. have been considering establishing branches in several other Canadian cities but are not likely to do so just at present owing to disturbed business conditions occasioned by the war.

C. De Wolf Reed, Montreal representative of the Provincial Paper Mills, Limited, spent a few days in Toronto last week and paid a visit to the mills of the company at Thorold, Georgetown and Mille Roches.

Mr. Featherstonhaugh, formerly with McFarlane, Son and Hodgson, Montreal, has joined the selling staff of J. C. Wilson, Limited, Montreal. J. R. McGregor, late sales manager of the firm, who recently resigned, is going into the jobbing business in Montreal in his own behalf.

Alex. Cowan and Sons, Limited, paper makers of Edinburgh, like many other British firms which have done a large business in the paper line in the Dominion, have sent out notices to their Canadian customers that, in view of the present situation in Europe, then can only accept orders conditionally both as regards price and delivery. It is possible, the firm adds, that they may be totally unable to execute them or they may have to introduce an advance in price, and that it is impossible to say more at the present time on the outlook.

Vesta Press, Limited, with a share capital of \$40,000 and head offices in Toronto, has been granted a charter. They are empowered to engage in the business of printing and publishing and engraving as well as to carry on the business of making wall paper, paper boxes, printings, etc.

It is said that pulpwood operations in the woods will be larger this year than for many seasons past especially in connection with the cutting of spruce, which is required to make up the depleted spruce resource occasioned by the exceptional demand for news print and ground wood owing to the war.

Arnold and Bell, Limited, with a capital of \$100,000 and headquarters in Stabury, Ont., have been granted a charter. Wm. J. Bell and John Parker Reid, lumber men of Stabury, are behind the enterprise, and the new concern is empowered to manufacture lumber and sawdust, sell and deal in timber, limits, logs and saw products as well as to manufacture and sell pulp and paper.

The Parry Sound Lumber and Manufacturing Co., Limited, of Parry Sound, Ont., are one of the recent ones incorporated, granted a charter. The capital of the company is \$200,000, and they will manufacture lumber and types of all kinds and wood products, also products such as toothbrushes, clothespins, etc. The incorporators are Charles L. Sanborn, Wm. A. Leach, and John P. McKelvey, of Toronto, John A. Leach and T. C. Adams all of Parry Sound.

It is hard to get bonds in war time as the financial conditions are affecting guarantee companies. This fact was brought out before Chief Justice Falconbridge at Osgoode Hall, Toronto, last week, when an injunction restraining the Russell Timber Co. from rafting 4,900 cords of pulp wood across Lake Superior from Black Sturgeon River to Ashland, Wis., was dissolved, upon the timber company giving a bond of \$12,000. Walter Hall Russell of the company made an affidavit telling how the war had made it difficult to secure a guarantee bond. There would have been no trouble prior to the present outbreak to get over with any of the companies. Though this company showed a surplus of \$98,000 last July, all the guarantee companies had refused to grant a bond unless cash or cash securities were put up to cover the amount. G. T. Clarkson, of Toronto, as assignee of the Northern Islands Pulp Woods Co., made a claim against the wood in question.

The Garden City Paper Mills, of St. Catharines, and the Interlake Tissue Mills, of Merriton, Ont., are both making creditable exhibits at the Canadian National Exhibition in Toronto, having nicely fitted up booths in the Manufacturers' Annex in which many lines of toilet and tissue papers are displayed and also the numerous specialties which are turned out. The showing made by both companies is a tribute to the enterprise of these industries.

Samuel Price, K.C., chairman of the Workmen's Compensation Commission for Ontario, states that the organization of the new department is assuming definite shape. The necessary forms are being drafted and out to manufacturers and all other employees of labor requiring information as to the number of men employed, duration of employment, pay roll and such other data as is necessary, to enable the board to adjust the schedules and determine the assessment that each industry or group of industries shall bear. When this information is all received, it will be collected and available for reference and then the rate will be struck in accordance with the industrial hazard of the various occupations. It is not likely that the new law will be in operation before the beginning of next year.

On the occasion of his departure for Valcartier, the members of the Toronto Art Club presented their Secretary Treasurer, Lieut. A. J. D. Davidson, with a handsome wrist watch. He will be appointed Quarter Master of the Second Corps of the Canadian Engineers.

A scheme has been submitted to the Ontario Government and the Hon. W. H. Hearst, Minister of Lands, Forests and Mines, will make a report upon it, which will give work to the unemployed and at the same time develop the country. It is to the effect that the Ontario Government open up a certain number of sections in Northern Ontario and that the land could be cleared among the winter growth of pulp wood. The country would in this way be improved, and the land appropriated in value. The work could be done without costing the government a cent. By next summer much of the soil would be ready to grow crops.



The Markets

CANADIAN MARKETS.

The market situation, owing to the war, remains uncertain so far as prices on the general lines of paper and pulp are concerned. In newsprint, which is in abnormal demand, both from a domestic and foreign standpoint, there are no fixed quotations, particularly for export business. The circulation of some Canadian papers, since the outbreak of hostilities, has increased fully fifty per cent., and one Canadian newspaper, since the last of August, has gone up from twenty-five to forty per cent. All mills are working to capacity, and machines are being speeded to the utmost. Of course, all Canadian mills will be asked to their contract customers first, before selling to the numerous outside firms which are clamoring for quotations by letter, telegram, and cable from almost every country in the world.

It is understood that some of the larger Canadian mills have secured orders for as few as half a ton as two and a half cents f.o.b. mill. This is exceptional, and applies to war prices and instant delivery. A leading authority stated this week that he would not be surprised, if the interest and uncertainty of the war kept up, to see newsprint, on foreign shipments, at least, touch three cents. Orders are now being shipped to England, South Africa and South America, as well as much larger quantities to the United States. Practically all quotations have been withdrawn, and the price will be regulated by demand and supply. Every plant is working to one hundred per cent. efficiency, and when domestic contracts are renewed at the end of the year, publishers will have to pay higher.

In sympathy with the call for greater quantities of newsprint, the price of ground wood is stiffening, and one Canadian mill reports that it was asked twenty-five dollars per ton for fifty tons of No. 1. This is a record mark, although shipments are being made to the United States at this figure. Book and writing, coated paper and tissue plants have, in the majority of instances, withdrawn all figures. In tissue papers there has been an advance of about five per cent., but on book and writing, bond, ledger and fine, the same figures hold, only the mills want to be in a position to raise if they have to pay too high for the material, for sulphite pulp has taken a big jump. Then there may be all sorts of difficulty in getting foreign rags, dyes, chemicals and as well as essential finishing, such as finish, etc., from abroad. The market locally has been scoured and in some instances dyes have gone up one hundred per cent. and over.

Book and writing mills do not wish to take advantage of customers, and, for that reason, to safeguard their own interest, have adopted the precaution of withdrawing prices. If there is an advance in raw materials they will have to augment prices so unpathetically to the extent where they are called upon to expend. There are about nine million dollars in English book, coated, ledger, art, surface finish and other foreign papers coming into Canada each year, while local production is only about two-thirds of this amount. English and Scotch mills have advised the trade in the Dominion that they will only accept orders conditionally, both as regards price and delivery.

Representatives selling German papers are closing out their stocks locally. Manilas, paper bags, and kraft is strengthening in price.

As for ground wood, that market, which has been dull for nearly a year past, has taken on new life, owing to the shutting off of foreign supplies. The same may be said of sulphite, which has gone up in some cases as much as ten dollars per ton for No. 1 unbleached. Only small lots are open. Customers, who have contracts, will be fully taken care of. One Canadian mill received enquiries within one week for twenty thousand tons from American consumers. About twenty-five thousand tons have been received monthly by American mills from abroad, and there will be no competition from Germany, Austria, Sweden or Norway. Just what the price will be, as soon as the supplies, which are now on docks at Atlantic ports, are landed, cannot be told at the present writing. The Canadian market looks to be very grave. Canada has been shipping to the United States about six or seven thousand tons of sulphite per month, and cannot continue this long.

The altitudes put us very determined within the next thirty days as to what altitude prices will touch. With conditions in the Dominion, considering the severe rains of late, continue very good for this season of the year. The situation in the rag and paper stock market is about pretty much the same state of affairs as in pulp, and prices have been raised on many lines. The time is coming when the pulp and paper lines are going to be made pretty much on individual orders, and the number of ground wood pulp, sulphite, etc., so far as Canada is concerned, ascending values will probably reach the highest point known in years. There is no question on the part of any mills to cancel any contracts which have been made, but on the other all will seek to secure the best arrangement possible. Most papers are scarce, and higher prices are being asked for paper.

Quotations, f.o.b. Toronto are:

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in carload lots.
News (sheets), 40 lbs. to 50 lbs. at mill, in carload lots.
News (sheets), \$2.25 to \$2.50 depending on quantity.
Fine papers (various), No. 1, 40 lbs. to 4.25c.
Fine papers (all lots), No. 1, 40 lbs. to 5.50c.
Bond papers (carload), No. 1, 4.25c.
Bond papers (ten lots), No. 2, 4.50c. to 4.25c.
Bond papers (carload), \$4.75 to \$5.25.
Bond papers (all lots), No. 3, 5.25c. to 6.00c.
Wrappings, 50 to 7 1/2c.
Sulphite bond, 40 lbs. to 7 1/2c.
Grey Browns, \$2.35 to \$2.75.
Sales, 40 lbs. to \$4.75.
Manila, B., \$2.90 to \$3.25.
Manila, No. 7, 40 to 60 lbs., 50.
Manila, No. 1, \$3.35 to \$4.10.
Ground wood, 40 to 50 to \$4.50.
Coated Kraft, \$3.75 to \$5.00.

Pulp.

Ground wood (at mill), \$16 to \$17.
Ground wood, \$22 to \$25 delivered.

Sulphite (bleached), \$18 to \$50, delivered in Canada.
Sulphite (unbleached), \$50 up, delivered in United States.
Sulphite (bleached), \$58 to \$60.
Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.80 to \$1.85, f.o.b., Toronto.
No. 1 soft white shavings, \$1.75.
No. 1 mixed shavings, 50c.
White blanks, 80c to \$2.10.
Heavy ledger stock, \$1.40 to \$1.45.
Ordinary ledger stock, \$1.10.
No. 2 book stock, 45c to 50c.
No. 1 book stock, 50c.
No. 1 Manila (white), 40c to \$1.10.
No. 1 print Manillas, 60c.
Folded issues, 40c to 45c.
Over issues, 50c.
No. 1 clean mixed paper, 39c, to 35c.
Old white cotton, \$2.50 to \$2.75.
Thirds and blues, \$1.35 to \$1.40.
No. 1 white shirt cuttings, \$5.25.
Black overall cuttings, \$1.75.
Black linings, \$1.75.
New light hannelettes, \$5.00.
Cottons, Saturdays, 80c to \$2.10.
Flock, 90c to \$2.10.
Tailor Rags, 70c.

Prices in Montreal remain about the same, the only difference being in the substitution of spot quotations instead of contracts.

Quotations f.o.b. Montreal are:

Book and News Paper.

Ree News, \$10 to \$13 per ton for large orders; \$45 to \$50 per ton for small orders.
Ree News, \$15 to \$17 per ton for large orders; \$50 to \$60 per ton for small orders.
No. 1 Book, 30c to 50c per lb.
No. 2 Book, 8c, \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.00 in small quantities.
No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.60 in small quantities.
Wrappings, 5c to 7 1/2c.
Brown, 6 1/2c to 8 1/2c.

Wrappings.

Red Brown, per 100 lbs., car lots, \$2.25 net; 5 tons, \$1.45; 2 tons, \$2.00; 1 ton, \$2.65; less, \$2.15.
Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.00; 1 ton, \$3.15; less, \$2.25.
Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.00; 1 ton, \$3.15; less, \$2.25.
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Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.00; 1 ton, \$3.15; less, \$2.25.

timers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
News quality, \$41 to \$42 per ton.
Bleached sulphite, \$54 to \$59 per ton.
Kraft pulp, \$3.60 to \$4.00.
Ground wood, No. 1, \$3.15 to \$16.
Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS.

New York, August 25, 1914.

The opinion in the local market regarding the ground wood situation is that there has been too much reaction of its real phases. The loss of 10,000 tons by fire only a few weeks ago has already shown some influence on the market. Some grinders have attempted to take advantage of the present situation, and have offered their fresh pulp at a mill price of \$25. No paper mill would consider such a figure. Other fancy prices are still higher ranging from \$21 to \$24. The real prices of ground wood were made at \$17.50 to \$18.50 f.o.b. mill. Good supplies have been moved at these prices.

The same the sulphite situation is somewhat brighter. Manufacturers have decided that it is the best policy not to take advantage of the impossibility to get foreign pulp and have put a price of \$42.50 to \$45 f.o.b. mill on unbleached sulphite. Some quotations such as \$50 and \$60 f.o.b. mill, even made by manufacturers of sulphite, who found no market for their goods at that price. There was almost a state of wildness in the foreign pulp market during the first week, after the war began. Fancy prices were quoted among many importers. Then it became evident that there was really very little to the talk that passed from mouth to mouth regarding prices. The truth is that importers did not sell except to regular customers and then no advantage was taken. Importers have tried to make a pro rata division of the small supplies they have on dock, amongst their contract customers. There are no prices.

The foreign rags and baling situation is the same as the pulp market. No quotations are made, and when supplies are available are being fairly divided amongst regular customers. Mills are less inclined to reject materials now, and in fact have accepted without protest, goods that they have rejected after paying all freight costs.

Domestic rags are scarce, and prices in all grades have gone up under a fair demand, from 1c to 1c a pound. There is a great deal of talk among packers about what prices they will move stuff. Most of this seems to be imaginary activity, for the dealers in domestic rags are not buying stock where there is a profit. Packers have, in some cases taken advantage of the present situation and have failed to deliver goods on account of some dealers. On investigation the dealers learned that the goods were shipped by the packer at the order of someone else who offered about \$2.00 a hundred for the goods.

Most old waste papers have been rather plentiful since the cessation of ship shipments, paper containing news being being looking for substitutes. Kraft and Manila papers have, therefore, been in good demand at \$1.00 to \$1.25 a hundred and most old manillas sold at \$1.00 a hundred and that stock advanced from 10c to 15c a hundred and that stock advanced from 10c to 15c a hundred and that stock advanced from 10c to 15c a hundred.

\$2 to \$4 a ton over previous quotations. There are plenty of old newspapers on hand on account of the heavy editions of newspapers in this city. Prices, despite this have advanced about a dollar a ton for all grades of old news. Mixed papers sold at 42½ to 45 cents a hundred.

Pulp.

Quotations on all European pulps have been withdrawn and available supplies are commanding very high levels. The following ranges are purely nominal and cannot be taken as a criterion of the market.

Ground Wood, No. 1, \$20 to \$24, delivered.

Ground Wood, No. 2, \$17.50 to \$20, delivered.

Unbleached Sulphite, domest., 2½ to 2½ f.o.b. mill.

Unbleached Sulphite, impt., 2.25 to 2.45, ex dock, New York.

Bleached Sulphite, domestic, 2.80 to 3.00.

Bleached Sulphite, impt., 3.00 to 3.55, ex dock, New York.

Easy Bleaching, impt., 2.75, ex dock, New York.

Unbleached sulphate, impt., 2.25 to 2.35, ex dock, New York.

Bleached sulphate, impt., 2.80c to 3.00c, ex dock, New York.

Kraft Pulp, 2.25 to 2.35, ex. dock, New York.

Paper.

The demand for all grades of paper has advanced to some extent. Prices in all grades have been withdrawn, but the quotations given below give an idea of the price at which paper has been sold in New York. Jobbers have had only small stocks, and are now making a stiff effort to cover their shelves before prices go any higher. Newsprint has moved rapidly on contract and sheet news has advanced from 2.15 to 2.35 f.o.b. New York. Newspapers have cut down the number of pages and have kept the consumptive increases at a minimum. With the large tonnage that was on hand at the turn of the year, there has really been little extra demand on newspaper mills. The feeling is that renewal prices will probably be a little higher than at present. Sales runs are very scarce. Manufacturers have not been running their machines any wider than is necessary to make the rolls for contract movement, and thus side runs have not accumulated. Offers of 2.20c a pound, f.o.b. New York, were made this week. Kraft papers have advanced a quarter of a cent a pound and are in good demand. Tissues are none too plentiful and prices are soaring. 45c to 50c a ream for a No. 1 white is not rare. Manila tissues reached the 50c mark and are likely to go still higher. The demand for pattern tissues has been very heavy and its price has gone up. Boxboards have been in the demand all at once being sold at the prevailing price of a few months ago. Prices on writings, bonds and ledgers have been withdrawn.

These quotations are purely nominal. All mills have withdrawn prices and quote only on orders for a 30 days' supply.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.

News, rolls, contract renewals, \$2.05, f.o.b.

News, side runs, 2.20

News, sheets, 2.35, f.o.b. New York.

Book papers, ear lots, M.F.S., \$3.75 to \$3.90 f.o.b.

Writing paper, superfine, 13½c to 17c, del. east of Miss. River.

Writing paper, extra fine, 11c del. east of the Miss. River.

Writing paper, No. 1, 9c, 9c, del. east of the Miss. River.

Writing paper, No. 2, fine, 8c del. east of the Miss. River.

Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.

Bond paper, 5c to 24c, delivered east of Mississippi River.

Ledger paper, 8c to 30c, delivered east of Mississippi River.

Linen paper, 7c to 18c, delivered east of Mississippi River.

Manila jute, 5c to 5½c, delivered.

Manila, wood, 2.65 to 3.25, delivered.

Kraft, No. 1, \$3.85 to \$4.00 f.o.b. New York.

Kraft, No. 2, \$3.25 to \$3.35 f.o.b. New York.

Boxboards, news, \$30 per ton, delivered.

Boxboards, straw, \$28 per ton, delivered.

Wood pulp board, \$42.50 per ton, delivered.

Tissue, white, cylinder, 45c to 47½c f.o.b. New York.

Tissue, fourdrinier, 50c f.o.b. New York.

Tissue, jute Manila, 45c to 50c, f.o.b. New York

NOT PESSIMISTIC, ANYWAY.

Leaders in the writing and bond manufactures, while regarding the present situation is intensely problematical, are not disposed to be downhearted over the outlook. There is every probability of a strong revival to Canadian-made goods, and whatever the demand prices should be good.

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Pulp and Paper Magazine

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No. 18

Cheerful but Careful

From all parts of the Canadian industrial world come reports that conditions are not nearly so bad as it was once feared they might become. While many lines of business are practically shut down, and charitable organizations are looking for a winter of unprecedented stress and activity, many trades and businesses are assuming almost normal proportions.

The Toronto correspondent of this magazine makes a statement which should bring cheer to the heart of almost all our readers, viz., that the large department stores are placing orders for a full supply of paper for catalogues. Those who are familiar with Canadian domestic and financial conditions, will realize that not only is this a welcome impetus to the paper industry, but it gives one of the best promises possible of good conditions in all parts of the country. The mail-order house is a very great factor in the distribution of goods from coast to coast.

* * * *

So far, despite rumors that a move would soon be made, there is no immediate prospect of the opening of the exchanges.

This is clear enough indication that, while conditions are bright, still, beyond the sunshine of today the weather is uncertain. The banks are taking no chances. This may be one underlying reason for the general optimism. The progress of the railways, the extension of credits, the possibilities of developments in export trade and the increase of Canadian manufactures are but a few of the influences that will have a bearing on the general situation. No man can predict with any degree of certainty what will be the movements of industry and finance in the near future. But all in all, the outlook is cheerful.

Practically without exception the pulp and paper manufacturers of the Dominion are quite confident and optimistic. The news market is holding well, and all other lines are firm. The demand for good qualities of pulp is keeping up satisfactorily, and orders by the score have had to be cut down or restricted by sulphite manufacturers.

About six weeks ago the available stocks of newsprint and sulphite began to be called into requisition. At the present time about fifty per cent of these supplies have been used up and it is probable that in another six weeks will see the end of the stocks.

After this period has elapsed, there is almost certain to be a rise in the price of Canadian pulp. There is almost sure to be a steady increased demand, and conditions in general will have settled down to a new level far above that which has been in evidence in the Dominion. Some of the largest manufacturers state most sincerely that the present prices of newsprint and pulp are not excessive. Contracts in nearly all cases are being taken care of without any advance whatever and the only instance in which there has been the slightest raising of prices to those who have placed orders with pulp and paper manufacturers is where there may have been some vacillation on the part of the purchaser or lack of confidence in the manufacturer. It is only fair to state in this connection that Canadian manufacturers as a whole have been absolutely loyal to their bona fide contracts in the United States as well as in Canada and reports to the contrary or rumors that there will be a throwing off of responsibility on account of the state of war in Britain, are neither well founded nor fair. Whenever such fears may have influenced American purchasers, it is almost certain that they arose through misinformation or a rumor which in troublous times are

nearly always current. The stories of the mining of the St. Lawrence which found credence a couple of weeks ago, are of the same nature. The censorship which is being placed upon the military movements might well be placed over some of the reports on industrial conditions in the Dominion.

* * *

Nor will any contracts suffer loss through the efforts of Canadian manufacturers to find new markets. It is expected that the newsprint manufacturers will go ahead with their plans for the development of the South American trade. In this they have the full support of Sir George Foster, Canadian Minister of Trade and Commerce, who issued not long ago a bulletin urging Canadians to exert themselves to the utmost to make good their opportunities to secure the markets vacated by the Germans. Sir George points out in his bulletin that Germany even ships almost half a million dollars' worth of paper to Canada and there are beside the great fields which are now cut off from any export by the German nation.

It must be borne in mind, however, that South American trade will have to be well secured before it can be accounted sure.

A moratorium has been in force, and the industrial conditions have not been any too stable. It has taken time to build up Germany's foreign trade, and it will take time to do the same for Canada. Again, the war will not last forever, and it would be wise for exporters to see themselves well protected by proper contracts before venturing.

EDITORIAL COMMENT.

One of the most interesting developments of the present war crisis is the probability that German patents in Great Britain and the Colonies will be cancelled and thrown on the market by the respective Governments.

It is well known that in Great Britain the value of German inventions in the papermaking industry runs into millions of dollars, and in Canada not a few German devices and processes relating to paper making have been protected. In Ottawa, Montreal and Toronto there is already considerable activity among manufacturers, actual and prospective, and it would be no surprise if many devices which have heretofore been incomplete because of the basic nature of the foreign claims should be manufactured.

* * *

In our present issue we have peculiar pleasure in presenting to our readers a thoughtful article by an efficiency engineer of wide experience, Mr. Edward J. Trimbley, M. E., of the Canada Paper Company. Mr. Trimbley has shown in his article that grasp of scientific investigation which is so refreshing to the man who wants accuracy and thoroughness in his work. It is an unusual method which Mr. Trimbley has pursued, and his results will find hearty appreciation throughout the industry.

For Improving Soda Pulp Production

From the Forest Service, U.S. Department of Agriculture.

Why some soda pulp mills are using from 10 to 20 per cent more pulp wood, from 50 to 100 per cent more chemicals, and from 10 to 40 per cent more steam, and require much larger plants and more labor for the same output per day than other mills, making a similar product is explained by the U.S. Department of Agriculture in a recently issued bulletin. The answer is to be found, in part at least, says the bulletin, in lack of knowledge concerning the effect upon the yield and quality of pulp of such factors as amount of caustic soda per pound of wood, duration of cooking, pressure or temperature of cooking, and concentration of the cooking chemicals.

Experiments carried on at the U.S. forest service laboratory with clear sound aspen wood gave yields of good pulp ranging from 10 to 25 per cent higher, than the better run of yields reported by pulp mills and in some cases with shorter cooking periods and less chemicals. Yields of well-separated unbleached pulps as high as 56 or 58 pounds per 100 pounds of wood can be obtained from aspen, says the department, if the wood is of the best quality. Yields of from 54 to 55 per cent were secured which required only from 10 to 11 per cent of bleach.

On the basis of the experiments it is stated that minimum cooking periods of from 3 to 4 hours may be used with aspen for bleaching pulps, provided the other cooking conditions are properly maintained. Greater severity of cooking is accompanied with a decrease in the yield of crude pulp, and usually of screened pulp. While the amount of bleach required decreases with increasing severity of cooking, a point is soon reached where such decrease fails to counterbalance the decrease in yield. Moreover, the decreased yields from more severe cooking result in a greater cost of wood and soda per ton of pulp.

Increasing the initial amount of digester liquor increases the condensation and steam consumption (and hence the cost) because of the greater volume to be heated. Increasing either the duration or pressure has a similar effect, because of the greater loss of heat by radiation.

From a study of the results of these experiments, says the department, it should be possible for a mill operator so to regulate the cooking process as to secure the largest possible yield of pulp of the desired quality at a minimum cost for chemicals, fuel, labor, and overhead charges, so far as the operation is affected by the cooking conditions considered.

In making prophecies as to the progress of Canada in the near future and after the war, the financial and industrial experts in all centres are laying great stress upon the assured prosperity of the pulp and paper industry. When other businesses are having difficulty the paper trade is almost certain to succeed well.

THE DRYING OF PAPER

By **EDWARD J. TRIMBEY, M. E.**

Efficiency Engineer with the Canada Paper Company

(Written Specially for the Pulp and Paper Magazine)

The proper drying of paper is a matter of considerable importance from the standpoint of both quality and economy. Various devices are in use to regulate the drying by controlling the temperature or the pressure, and there are various systems for removing the condensed steam from the dryers and for preventing the loss of steam from the dryers before condensation by the use of individual traps for each dryer, or by using larger traps for a number of dryers. The advantages to be gained in this way are well known but there are a number of other points in connection with the drying of paper which are of considerable importance but are not generally known.

Some time ago the problem of increasing the production of a certain machine making bag and manila papers was brought up and it was found that the production was held back on account of lack of drying surface. The question then arose whether the back pressure would be increased and if so, what increase would be necessary, and what effect would this have on the strength; should extra dryers be added; or would the addition of felt dryers, by removing moisture from the felts, increase the rates of drying.

Many tests have been made to determine the total amount of steam used by the dryers as a whole, either by metering the steam supplied to them, or by passing the condensed steam from them through a condenser and weighing it in open tanks, but no one seemed to have any definite information as to the rate of drying on the individual dryers, or as to the effect of back pressure or felt dryers. It would be rather a difficult matter to measure the amount of steam condensed by the individual dryers as to do so it would be necessary to use a separate condenser and weighing tank for each dryer, and also to provide some means of preventing the steam from escaping from the dryers before being condensed.

It was thought that the work done by several of the last dryers could be easily determined by taking samples of the paper going to the reel and drying out for per cent of moisture, and then by passing some of these last dryers, one at a time, and again taking samples for moisture. This method worked satisfactorily until two dryers had been by-passed but by that time the machine began to disappear behind the pile of "broke," and it was seen that some other method would need to be devised.

The method finally decided upon as the most feasible was to have the machine tender insert the "squirr" about fifteen inches and cut off a strip twenty or thirty feet long, then draw the "squirr" to the edge of the sheet, and, after waiting about ten seconds, repeat the operation. Starting back at the last dryer the back tender tore off this strip when it came through, and it was immediately placed in a covered can. The next strip was torn after passing the preceding top dryer, the third strip after passing the next preceding top dryer, and so on until the last sample was taken from the last press before coming to the dryers. Each sample as taken was placed in a covered can and as soon as possible a given amount was weighed and

placed in the drying oven where they remained until there was no further loss in weight. While these samples were all taken from the front side of the sheet and might not represent the average of the entire width of the sheet, the results obtained were relative and showed the increase in the percentage of bone-dry paper as the sheet travelled from dryer to dryer and, by computation the amount of water evaporated from the sheet by each dryer could be determined. Having found that this method could be used for making a detailed study of the rate of drying if desired, it was decided to first determine the relation between the strength factor and the steam pressure on the dryer header.

In order to eliminate variations in strength which would be due to variations in the relative amounts of ground wood and sulphite furnished these tests were made on a machine making a 100 per cent sulphite sheet. Tests were continued for ten hours a day for six days, taking samples from each reel made during

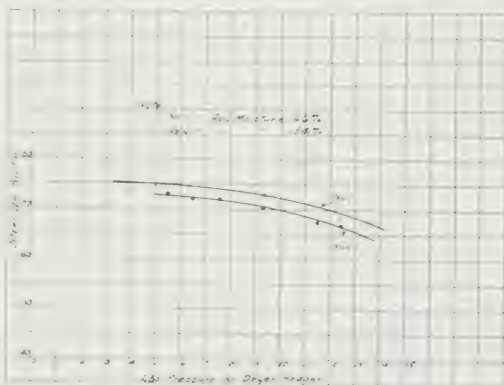
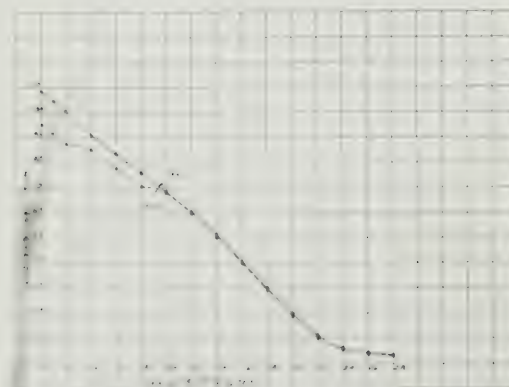
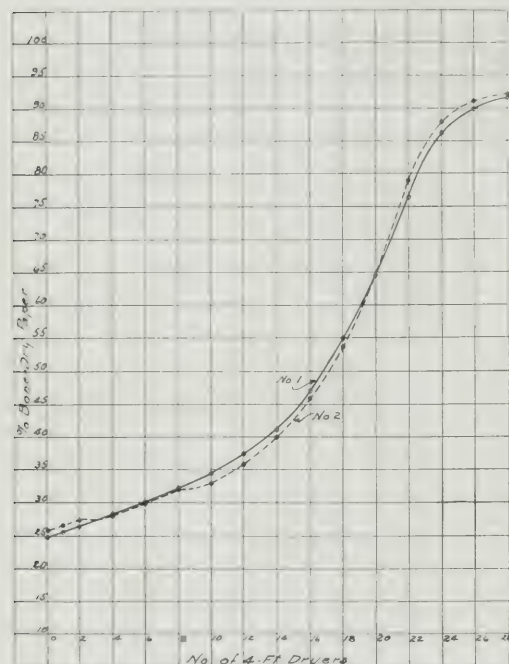


Fig. 1—Showing effect of moisture and pressure on the dryer header, on the strength of bag paper.

this time. Duplicate sets of samples were taken, one set being tested for moisture and the second set for weight and strength. The second set consisted of four sheets which were weighed together to obtain a fair average, and each sheet was then tested in four different places with the Mullen Tester, thus giving the average of sixteen tests for strength for each reel. The ratio between the bursting strength and the weight per ream on the 24in. x 36in.—500 basis was taken as the "Strength Factor." The steam pressure on the dryer header was noted each time samples were taken.

While the object in view had been to determine the relation between the strength factor and the pressure on the dryer header it was found on working up the results of these tests, that the moisture in the finished paper had varied from 4.8 per cent to 8.0 per cent and

that the strength factor varied with the amount of moisture as well as with the pressure used for drying. The tests were accordingly divided into two groups, one group of thirty-five tests in which the moisture varied from 6.0 per cent to 8.0 per cent and a second group of thirty tests in which the moisture varied



Figs. 2 & 3—Showing effect on rate of drying, of by-passing dryers to act as felt dryers.

from 4.8 per cent to 5.9 per cent. These groups were further subdivided into sets of five tests each, taking those bearing approximately the same pressure on the dryer header and the average strength factor and pressure for those sets were plotted giving the curves shown in Fig. 1.

These curves show that while the strength remains fairly constant for pressures on the dryer header up to about seven pounds there is a rapid falling off when the paper is dried at a higher pressure; and also show that a reduction in moisture below six per cent causes a marked falling off in strength in addition to the loss due to the use of too high a pressure. With an average of 6.6 per cent moisture, the strength factor which is 74.5 per cent up to 7 pounds pressure on the dryer header falls off to 68 per cent at 13 pounds pressure, a loss of 8.7 per cent in strength, while when the average moisture in the paper was reduced to 5.4 per cent the strength factor was but 72.5 per cent at 7 pounds and 65.5 per cent at 13 pounds, showing a difference of 12 per cent in strength between a sheet dried at about 5 pounds pressure on the dryer header with 6.6 per cent moisture. This is about the difference which through the calenders. This series of tests was also one containing 25 per cent of ground wood.

To determine the effect of a greater percentage of moisture a second series of tests was made varying the moisture from 6.0 per cent to 8.6 per cent which was about as high as could be carried without danger of showing a water finish effect in spots when passing through the calenders. This series of tests was also divided into two groups, one group of those containing less than 7 per cent of moisture and another of those containing 7 per cent or more. The results for the various pressures for these two ranges of moisture give curves which practically coincided, and were near enough to warrant the conclusion that when the percentage of moisture in the dried paper is from 6.5 per cent to 7.0 per cent a small increase in the amount of moisture does not materially affect the strength. A large increase in the amount of moisture would no doubt reduce the strength, though no tests were made to determine this point. It is quite likely that within practical limits the strength, would not be affected.

Having determined that it was not economical to increase production by using high back pressures, the next point investigated was the influence of felt dryers on the rate of drying. This was done by taking samples of the paper from each alternate dryer from the calenders back to the last press, as described above, and determining the per cent of bone-dry paper at each point. Fourteen tests were made in this way, seven tests with the paper passing over all of the dryers, and seven with the sheet by passing the third and ninth dryers from the wet end.

The results of these tests are shown by Figs. 2 and 3. Both sets of tests were reduced to the same speed and pressure on the dryer header for better comparison; the average weight for the first series of tests when all of the dryers were in use was 24 in. x 36 in. x 500—39.2 lbs. and came to the dryers at an average of 24.9 per cent bone dry, while for the second series of tests when the third and ninth dryers from the wet end were by-passed the average weight was 36.2 lbs. with an average of 25.9 per cent bone-dry paper in the sheet coming to the dryers.

In Fig. 2, which shows the per cent of bone-dry paper as the various dryers were passed, curve No. 1 corresponds to the first group of tests with all of the dryers fully, they continue equal on passing the 6th and 8th when two dryers were by-passed. Curve No. 1 shows a steady increase in the percent of bone-dry paper from 24.9 per cent when leaving the second press, to 91.8 per cent on leaving the last dryer. Curve No. 2 starts from the second press at 25.9 per cent bone-dry paper and continues parallel to Curve No. 1 while passing the

first and second dryers but drops off at the third dryer. While at the start No. 2 contained one per cent more bone dry paper than No. 1, at the fourth dryer they are practically equal containing 28.2 per cent respectively of water per ream. The pounds of water per dryers at the ninth dryer, which was by-passed, No. 2 again falls off and at the tenth dryer contains only 33.0 per cent dry bone paper as compared with 34.5 per cent for No. 1, when none of the dryers were by-passed.

This machine was equipped with dryer felts in two sections; on leaving the fourteenth dryer, where the first section ends, the 39.2 pound sheet which left the presses containing 24.9 per cent bone dry paper has reached 40.9 per cent bone dry with all the dryers in use, while the 36.2 pound sheet which left the presses containing 25.9 per cent bone dry paper has reached only 39.9 per cent bone dry with two of the dryers by-passed. After leaving the fourteenth dryer the percent of bone dry paper increases more rapidly in the second series of tests than in the first series and reaches 91.2 per cent on leaving the twenty-sixth dryer as compared with 89.9 per cent but this is due to its being a lighter sheet, with the speed and pressure on the dryer header the same in each case.

The curves in Fig. 3 show the reduction in the total weight of water per ream. The pounds of water per pound of bone dry paper have been computed for the paper leaving each pair of dryers and this has been multiplied by the bone dry weight per ream; this gives the total pounds of water in a ream of paper as it passes each pair of dryers and as the amount of water removed from the sheet is the measure of the work done by the dryers, these curves show the effect of by-passing more plainly than the curves in Fig. 2.

When none of the dryers were by-passed the average weight of the sheet was not only three pounds greater than in the runs with the dryers by-passed, but it contained one per cent less bone dry paper, and consequently more water. The pounds of water per pound of bone dry paper leaving the press being 3.01 as compared with 2.86. This gives an average of 108.4 pounds of water in each ream of paper as it left the second press in the tests when no dryer was by-passed, and only 95.3 lbs. of water per ream in the tests when two were by-passed. On leaving the fourteenth dryer the amounts were 51.8 pounds and 50.4 pounds respectively. In the first case 56.6 pounds of water had been removed while in the second case only 44.9 pounds. In the tests when no dryers were by-passed there was 60.1 pounds of water per ream on leaving the twelfth dryer, or 48.3 pounds had been removed by twelve dryers when the sheet passed over all of them as compared with only 44.9 pounds when fourteen were used and two of those were by-passed.

This proves that in by-passing a dryer to act as a felt dryer that the effect of the dryer is lost entirely for drying paper, and that the addition of a felt dryer to a paper machine would have no effect whatever, aside from increasing the life of the dryer felts.

By the use of the "squirt" as previously described, samples were taken from the last six or eight dryers, from the first dryer and from the last press. Having the pounds of water per pound of bone dry paper at the first dryer and when dried, the difference multiplied by the bone dry weight of the sheet gave the total pounds of water per ream removed from the dryers. This divided by the number of dryers employed gave the pounds of water removed per dryer per ream at the given speed.

After the sheet has reached 90 per cent bone dry it is more difficult to remove the last two or three per cent of moisture, so to make conditions uniform the range taken was between the wet paper leaving the press and paper dried to 90 per cent bone dry. To bring all of the tests to a common basis the pounds of water removed per dryer per ream was divided by 3000 square feet in 500 sheets 24 in. x 36 in. to give the amount per square foot of paper and this multiplied by the speed in feet per minute if the speed were 400 feet per minute, each square foot of paper would be in contact with a given point on each dryer only one four-hundredth as long as it would be if the speed were one foot per minute. This gave "pounds of water removed per dryer per square foot of paper at one foot per minute," which is a basis to which all the tests could be reduced for comparison.

In this way tests were made on a number of machines and it was found that not only did the amount of water removed per dryer increase with the pressure on the dryer header, but that the rate of increase with an increase in pressure was not the same for different machines, nor for the same machine on different days.

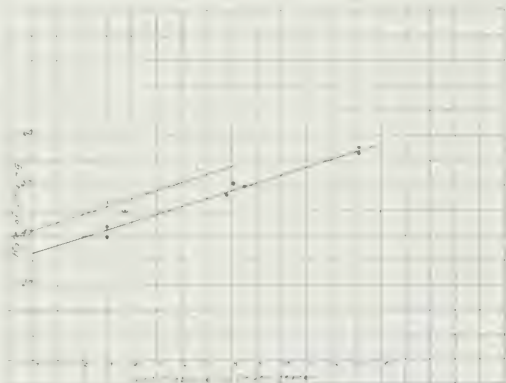


Fig. 4—Showing variation in rate of drying on different days.

Fig. 4 shows the results obtained on one machine on two different days, Jan. 15th and Feb. 16th. Each test is represented by a point, and while the tests taken on each day give points which locate a straight line, one line is considerably higher than the other and they are approximately parallel. The variation between different machines is shown by Fig. 5 which gives the relation between the rate of drying and the pressure on the dryer header for three machines. The rate of drying for No. 3 is nearly 30 per cent greater than for No. 1 and the two curves are approximately parallel showing equal increments for the same increase in pressure on the dryer header; for No. 2 the rate of drying is but little greater than for No. 1 at atmospheric pressure. These machines were equipped with one header supplying all the dryers and the gauge showing the pressure was connected at about the center. No. 1 and No. 3 were equipped with 28 dryers, and No. 2 with twenty dryers.

When the average rate of drying has been determined it is an easy matter to construct a set of curves which will give at a glance the approximate pressure on a dryer header which it is necessary to maintain to a given degree of dryness when coming to the dryers.

The condition of the felts, the weighting of the presses, the character of the stock, etc., determine the degree of dryness to which the sheet will be pressed, so if a set of curves have been determined for any machine on the assumption that the sheet will be, say 30 per cent bone dry, coming to the dryers, these curves can be

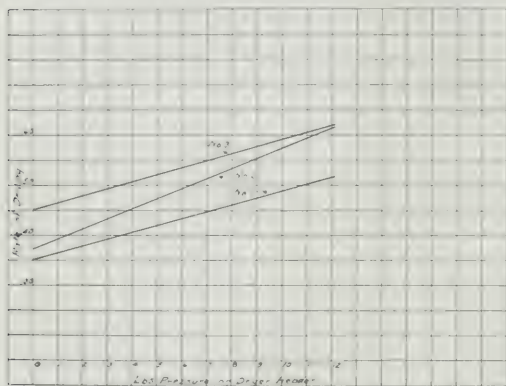


Fig. 5—Showing variation in rate of drying on different machines.

used as an indicator of the degree of dryness which is actually obtained; for if the sheet is less than 30 per cent bone dry it will require a higher pressure on the dryer header to properly dry it than will be shown for the actual weight and speed. Fig. 6 gives a set of curves for the machine No. 2, the rate of drying of which is shown in Fig. 5. In making the computations for these curves it was assumed that the paper would be 3 per cent bone dry coming to the dryers, and that it would be dried to 90 per cent bone dry paper on leaving the third active dryer from the calender end; thus leaving two active dryers to complete the drying

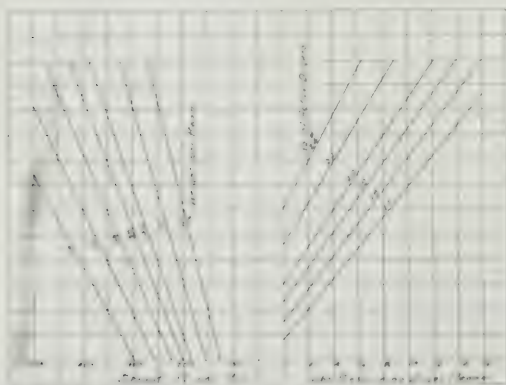
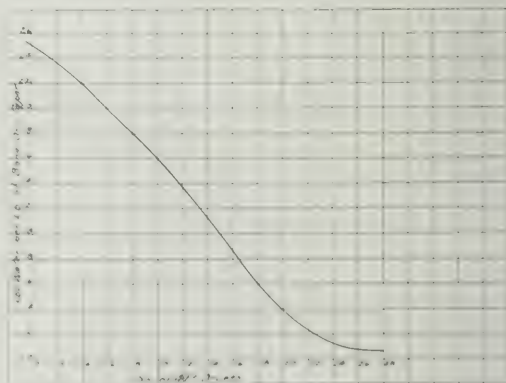
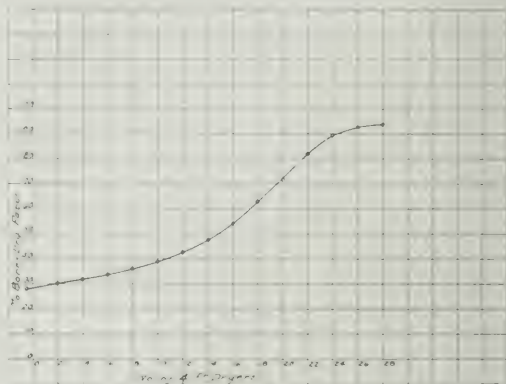


Fig. 6—Showing pressure on dryer header necessary to dry paper of given weight at given speed.

from 30 per cent to about 94 per cent. To use this set of curves assume that the machine was running 400 feet per minute and making a 36 pound sheet, what pressure on the dryer header would be necessary if no steam was used in the last dryer, leaving nineteen active dryers and keeping the last dryer

cool to improve the finish? Finding the intersection corresponding to 300 feet and 36 pounds and projecting to the right until we cut the line marked "nineteen active dryers" we find approximately 3 pounds pressure. Now supposing that we wish to increase the speed to 400 feet per minute while running a 36 pound sheet and wish to by-pass one dryer to act as a felt dryer, and also to run the last dryer without steam, how many extra dryers would need to be added to the machine so as not to exceed 6 pounds pressure on the dryer header? Using the curves as before we find that it would require twenty-two active dryers, or twenty four dryers in all.



Figs. 7 & 8—Showing rate of drying.

Fig. 7 shows the results obtained by applying the "squire" method of investigating the rate of drying on a news machine making a 31 pound sheet at a speed of about 460 feet per minute, with a pressure of 5 pounds on the dryer header. This machine was equipped with twenty-eight four-foot dryers and a "baby" dryer, but no steam was used in the last dryer. This curve shows how the per cent. of bone-dry paper increase as the sheet travels from the presses to the reel. It is the average of two test made on different days.

Fig. 8 may be termed the reciprocal of the curve shown in Fig. 7. It shows the pounds of water per pound of bone-dry paper contained in the sheet on leaving the various dryers.

Fig. 9 shows the pounds of water removed per pound of paper per dryer at the given speed. With the exception of the first few dryers the points obtained determine a smooth curve. In testing the samples for per cent. of paper it is difficult to get results within one-fourth of one per cent., especially from the first few dryers when the sheet is about one-third paper and two-thirds water. An error of this

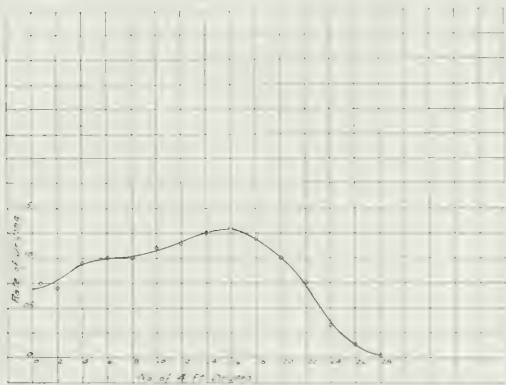


Fig. 9—Showing pounds of water removed per pound of paper per dryer.

amount is not noticeable on the curves given in Fig. 7 or Fig. 8, but would cause an error of from twenty to thirty per cent. in the value for that particular dryer in the curve shown in Fig. 9.

Fig. 10 is similar to Fig. 7, being the average of the results of two tests on a News machine making a 32 pound sheet at about the same speed. In this case the machine was equipped with thirty-six four-foot dryers and a "baby" dryer. This curve is shown for comparison with Fig. 7 to point out a common source of loss in connection with paper drying. A study of this curve shows that the sheet left the

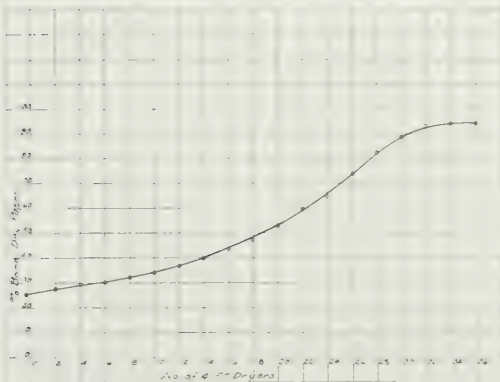


Fig. 10—Showing rate of drying.

presses at approximately 25 per cent. bone dry paper, reached 90 per cent. on leaving the thirty-first dryer and was about 94 per cent. on passing to the calenders. The point to be noted is that while in Fig. 7 the sheet had reached 30 per cent. on leaving the second dryer,

it did not reach 30 per cent. in Fig. 10 until it had passed part way over the sixth dryer, or, compared with Fig. 7, the steam used in three and one-half dryers in Fig. 10 was wasted and this is about 10 per cent. of the total steam used. Fig. 7 shows poor results from the presses as it is not at all uncommon to find the paper as dry as 30.5 per cent. to 31 per cent. bone-dry when coming to the dryers on two-press machines, and 30 per cent. should be maintained on the average. If the sheet in Fig. 10 had been pressed to 30 per cent. before coming to the dryers the steam used in the first five and one-half dryers would have been saved, thus saving 17 per cent. of the total steam used in the dryers, which would be a large percentage of the extra live steam needed for drying.

In Fig. 11 is shown the cost of evaporating this excess water left in the sheet when it comes to the dryers at less than 30 per cent. The assumptions made in computing these curves were that live steam would be needed to evaporate this excess water, that the finished paper was to be 92.5 per cent. bone-dry, that 1.33 pounds of live steam at 212 degrees F. and atmospheric pressure would evaporate one pound of water from the sheet, that 7.5 pounds of steam from and at 212 degrees F. would be obtained per pound of

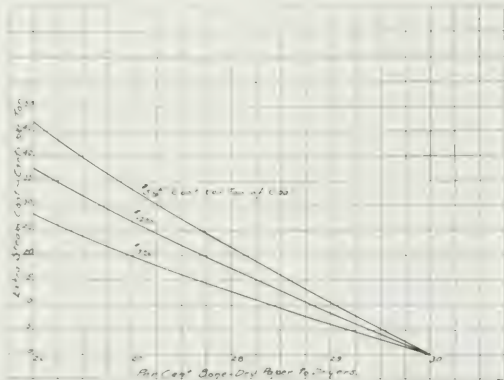


Fig. 11—Showing extra cost of drying paper when not properly pressed.

coal, and that ten per cent. of "broke" would be dried. With these assumptions for a basis, curves were drawn showing the extra cost for steam with coal at \$3.00, \$4.00 and \$5.00 per ton of 2,000 pounds. When it is seen that with coal costing \$5.00 per ton it costs twenty-seven and one-half cents per ton, or from \$8.00 to \$13.00 per day on one average News machine for live steam to dry the sheet from 27.5 per cent. bone-dry paper to 30 per cent., this is a stronger argument in favor of keeping the presses in condition to remove this excess water before the sheet comes to the dryers. A low "felt cost per ton" which is obtained by using as little weight as possible on the presses is poor economy, as the extra coal burned to produce the steam necessary to evaporate the excess of water will cost many times the saving in felt cost. It is quite a common thing to find machines on which, owing to the poor condition of the press rolls or light weighting of the presses, the paper is going to the dryers at from 25 per cent. to 28 per cent. bone dry paper. It is also quite common to find the paper dried to 95 per cent. or 96 per cent., or even as dry as 98 per cent.

come off when going to the reel, with a consequent loss of steam and at the same time the strength and "life" of the paper are partly destroyed by the excessive overdrying.

The effect which dryer felts have on the rate of drying is another point about which there seems to be no definite information. The argument is sometimes advanced that a sheet will dry faster, and with less pressure on the dryers, if no dryer felts are used as there will be a better opportunity for the moisture to leave the sheet. The other argument is that drying will be more rapid with dryer felts by reason of the felts holding the sheet in closer contact with the hot surface of the dryer. The latter argument is the one which proves out in practise. Some tests made on a machine making mill wrapper, both with and without a top dryer felt, showed that for the same speed, weight per ream, and per cent. of moisture in the paper going to the dryers that 10 pounds pressure on the dryer header was necessary with the top dryer felt in use, and 15 pounds pressure when the felt was removed.

Another set of tests showing the effect of the more intimate contact of the sheet and the dryer surface

whether the saving in felts would not be more than offset by an increase in the cost of drying. The article also mentions the running of the web straight from the coucher to the drying cylinders without passing through the presses; while this may be necessary in order to produce certain grades of soft boards, the greatly increased cost of evaporating the large amount of water in the sheet going to the dryers would prohibit this method of operating except in cases where an especially soft board was desired, or where the management failed to realize what an expensive way this was in which to save the cost of felts for the presses.

Fig. 12 is of interest even though it may have no practical application. It shows the increase in strength factor in a bag paper when the sheet is taken from the dryers containing various amounts of moisture and is then allowed to complete its drying at room temperature. There is a fairly uniform increase in the strength factor from about 58.5 per cent. when the drying is completed on the machine, to 72.5 per cent. when the last one-half pound of water per pound of paper is allowed to dry out at room temperature.

A number of articles on the drying of paper have recently appeared, treating the subject from both the practical and the theoretical standpoints. If any of the readers have made similar tests along these lines, or if this method of studying the rate of drying is adopted by other investigators it is to be hoped that they will publish the results obtained by them.

QUICK RUNNING CALENDERS.

Although rapid running of the calenders looks like making plenty of output, it has its difficulties in paper making, especially as there is a tendency to run the calender faster than it was built for. This may be all very well in the case of strong and elastic papers, and so long as only they pass through the calender. When, however, different sorts of papers, including weaker ones are run alternately, and of course, when it is a question of weak papers only, the speed must be reduced to correspond to the strength of the weakest paper. But it is practically impossible to keep on varying the speed for different sorts of paper, and the difficulty is accentuated by the fact that if the calender is run fast the pressure between the rollers must be heavy, or else the web has not the time to receive the necessary gloss. This heavy pressure makes the effects of any creases or inequalities of thickness in the paper absolutely permanent.

Fast running is also not without its effect on the calender itself. The stress on the bearings makes them very likely to run hot under the heavy load, and so great care is required in the lubrication, and that may even prove inadequate to prevent seizing or injury to the machine.

There is yet the further danger that the pressure may crush the paper so much as to affect the felting, and, therefore, the strength of the web. This is often manifested by a glassy look through, which it is impossible to attribute to any cause, whether imperfect sizing or otherwise that can be alleged. Yet may be mentioned. If the calender is running at a high speed, and it is necessary to stop it quickly for any reason, it is difficult to do so, and the braking strains the whole machine very severely. It must be evident from what has now been said that a quick running and a slow running calender should be provided, and that each should be restricted to the work which it is constructed to perform.—Papier Zeitung.

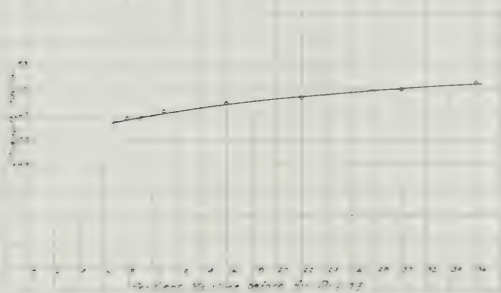


Fig. 12—Showing increase in strength when paper completes its drying at room temperature.

was made on a machine making "Newsboard." The dryers were in two sections, the first half supplied with exhaust steam and the last half with live steam. At one time screen plates with slots 0.060" were used and consequently there were many lumps in the sheet which would tend to hold the sheet from the dryers. When these coarse screen plates were replaced by others with slots 0.027" it was found that for the same speed and per cent. of moisture going to the dryers a 3 per cent. heavier sheet was dried with a pressure of 7 pounds on the dryer header of the first section of dryers and 8 pounds on the header of the last section that had been dried with pressures of 12 pounds and 31 pounds respectively, when the screen plates with 0.060" slots had been used.

In a translation from the "Wochenblatt für Papier-Fabrikation" a description was given of the manufacturing of boards on a Fourdrinier without dryer felts, noting that in this way the cost of production of cheap qualities of boards can be materially reduced and a better, more absorbent and porous board obtained. The article explains how the wet sheet can be handled as in the case of sheet dryer felts, but it is a question

WHO'S WHO IN THE CANADIAN PAPER TRADE

W. P. Gundy, Vice-President and Managing Director Kinleith Paper Mills Company.

By W. A. CRAICK.

(Written Specially for Pulp and Paper Magazine.)

The managing director of the Kinleith Company is perhaps better known as general manager of W. J. Gage & Co., Limited, the big firm of manufacturing stationers and school book publishers of Toronto. At the same time his connection with the paper industry is by no means simply a nominal one. Mr. Gundy takes a very close personal interest in the management of the St. Catharines paper mill, and its successful development under his direction is testimony to his ability as a paper manufacturer.

The eldest of four brothers, all of whom occupy positions of prominence in the commercial life of Toronto, William Pearson Gundy was born fifty-six years ago in St. Catharines, the son of the Rev. S. B. Gundy, a Methodist clergyman. Mr. Gundy, sen., was subsequently moved to Toronto, where he became in time chairman of the Toronto Conference, but his untimely death when his eldest son was only fifteen years of age, left the latter face to face with the necessity of going at once to work. Employment was secured for him in the office of the Queen's Printer for Ontario, a position then occupied by the late John Notman, and young Gundy began the business career in which he is still actively engaged.

To John Notman, Mr. Gundy gives credit for much of the success that subsequently came to him. The Queen's Printer was a shrewd, hard-headed and highly competent official, and he instilled in the mind of the lad methods and principles that have been of the utmost value. In his department, Mr. Gundy remained until he was twenty-three years of age.

In the early eighties, it will be remembered, there was a great exodus of young Canadians to the United States and the future general manager did not escape the infection. The civil service had little to offer him in the way of advancement, and he determined to ask Mr. W. J. Gage for one. He had already known his future employer for some time, and considered that a word from him would be effective. So he went to small establishment on Wellington Street West, and preferred his request. Mr. Gage, on learning his intention, threw out the suggestion that he might do better if he remained in Toronto, and offered him a position on his travelling staff. The offer was accepted, and the erstwhile clerk in the office of the King's Printer was transformed into a drummer.

Mr. Gundy's career from that day right down to the present time has been continuously associated with the Gage business. A year after he first went on the road for the firm, he was sent to Winnipeg to open and manage a western branch. Two years later he was recalled to Toronto and in 1890 was made manager. In 1893 he was taken into the firm as managing director, a title which he held until two years ago, when he was designated vice-president and general manager. During these years he witnessed a tremendous expansion in the business of the company. When he was first employed by Mr. Gage, the number of lines handled was considerable. To a general book business there was added miscellaneous

fancy goods, stationery and school supplies. The manufacturing end was comparatively small and unimportant. As the turnover grew, first one and then another department was dropped, the firm concentrating its activities on the production of a larger and larger proportion of their own manufactures. To-day the business is almost entirely self-contained, the manufacture of school books and stationery being the main concern of the management.

Mr. Gundy's association with the paper manufacturing industry dates back nine years. With the



development of manufacturing, the necessity of securing a steady supply of paper made itself felt. It was not that the price of paper was excessive, but simply because it was often difficult to get particular makes just when they were needed that led to negotiations being entered upon with the Kinleith Company. The latter business was acquired in 1905, and a new company formed in which the officers of the Gage Company became the sole shareholders. Mr. Gundy was appointed vice-president and in his hands was placed the general management of the business.

From the very outset the general manager began to take a personal interest in the Kinleith paper mill. He arranged to make a weekly visit to the plant, which he has paid regularly ever since. He undertook to master the technique of the process, and to familiarize himself with the details of the paper trade. From time to time improvements were introduced and the mill enlarged. To-day it is one of the best equipped mills in the country making book, writing and bond papers, of which a large proportion is consumed by the Gage Company.

Among the manufacturers of Toronto, Mr. Gundy may well be regarded as one of the most public-spirited. He has not confined his attention solely to his own business, but has found time for the discharge of other duties. Thus a few years back he held office acceptably as chairman of the Toronto branch of the Canadian Manufacturers' Association, while this year he is filling the position of president of the Toronto Board of Trade, with its unusually onerous duties most efficiently. He has been twice a delegate to the Congress of Chambers of Commerce of the Empire, once at Montreal and once in London.

Mr. Gundy's favorite diversion is hunting and, he greatly enjoys an expedition in the fall of the year, with two or three congenial spirits into the woods of Northern Quebec or Ontario after big game. Fishing likewise appeals to him, and this is a sport for which he usually finds a little time in the spring. For the rest he plays golf, being a member of both the Lambton and Rosedale clubs in Toronto, and also travels a good deal.

When asked to make a few observations on the conditions and needs of the paper industry, the managing director of the Kinleith Company said, "I feel that one thing of which the industry stands in special need is a much closer supervision on the part of the customs officials of the imports of paper into this country. I believe that for tariff purposes there is a good deal of under-valuation going on. The Government could render no better service to the industry than to see that the Customs Department makes an exact valuation of imported lines of paper. It simply means that while we have a tariff that enables us to manufacture paper in this restricted market that can compete in price with paper of similar character made in the United States or England, we lose the benefit of this protection when Canada is made the dumping ground for the surplus production of foreign mills, sold here at prices below those prevailing in the home market.

Also at this particular time I think that all our Canadian paper mills should carefully study the imports from abroad, which are now shut off by the war. It may be that they are only temporarily stopped, but it remains for Canadian manufacturers to say whether or not they shall be permanently shut out. We can accomplish this in a measure by turning our attention to supplying lines made in Canada to take the place of those imported. We may not be able to make the same goods, but we can make substitutes, and in this way help to solve the problem of unemployment.

Mr. Gundy, who is president of the Toronto Board of Trade, has been active in arranging for conferences of municipal authorities to devise means of supplying employment during the present financial crisis, has also taken a firm stand as to the duties of Canadian manufacturers in general. He feels that it is incumbent on every employer to do his utmost to keep the wheels turning and remembers that the man who re-

fuses to do his duty by those dependent on him is as great an enemy to his country as the soldier who turns tail and runs. Eventually he hopes to see Canada derive a great and lasting advantage from the war.

The Leipzig Exhibition

The following illuminating sketch of this famous exhibition is written by M. Olivier Rolland, of the well-known Canadian firm of bond and writing paper manufacturers. M. Rolland came from the centre of present hostilities after war had been declared.)

Leipzig is the leading city of Germany in the book and stationery trade. It is an intellectual centre, possessing the highest Court of Justice, and one of the most important universities of the German Empire. Its population is 600,000.

The exhibition was held under the auspices of the "Deutscher Buchgewerbe-Verein," on the occasion of the 150th anniversary of the foundation of the Book Industry Royal Academy. It was to have lasted until October. There was told the history of Graphic Arts. Walking along and visiting the pavilions,



Centre of the Exhibition.

one could follow its progress: beginning with the time when men engraved stone; following its work through 5,000 years; and finally reaching the perfection of our modern industries. All nations had contributed to the success of this exhibition. Great Britain, France, Russia, Italy, Austria had each erected their building on the Avenue of Nations; and in the international palace Switzerland, Holland, Denmark, Belgium, Sweden, Norway, Spain and Argentina were represented.

This magnificent tribute to civilization is now upset by war.

Six hundred learned men had cooperated under the direction of Mr. Lauprecht of Leipzig, to elaborate this plan, intended to show the progress of Graphic Arts, amongst all nations and all ages. The visitor could follow step by step its march through centuries. It was a complete success.

Stone was the first material used for writing purposes. One could see various inscriptions of symbolic character engraved on stone. This was before the appearance of any alphabet, when animals and all sorts of fantastic figures, served as the expression of

men's thoughts. America held a prominent place in the ethnographic section. A vertical plan of a "pueblo" which used to be the residence of a whole "Snala" in South United States, was shown, rich in inscriptions. A very old form of writing was illustrated by a group of Polynesians being tattooed. The Hieroglyph, in the Egyptian section, showed a decided step towards progress. There could be seen a reproduction of the famous Rosette tablet, whose original is in the British Museum, and by means of which, Champollion discovered in 1819, the key to the Hieroglyphic writing.

There was shown a reproduction of Chinese classical literature engraved on the stone of the Confucius temple, in Peking. The appearance of parchment marks an important forward movement. Made of the skin of animals, this material, which may be regarded as the oldest substitute of paper, was invented in the 400th year B.C. Numerous specimens were exhibited. In the art of printing, Korea was represented as the country using the first movable types. The fine Japanese manuscripts and prints from engraved wood exhibited showed that this nation was the cradle of art, in this industry.



Great Britain's Building.

Next in the exhibit was the substance which is the nearest to our paper: "Papyrus," upon which Egyptians used to write. Books made of this material were also exhibited. Greek and Roman antiquity was revived with a display of ancient writing instruments, such as the "stilus," "Calamus"; also precious documents, treaties, Judges' tablets, etc.

It was by the end of middle ages that paper reached Italy, and from that country, was introduced into Europe.

China, which is now considered as such a backward nation, was nevertheless the land where papermaking and printing were invented: Tsailum invented paper in the year 123 B.C.

Manuscripts of middle ages showed a beginning of luxury, with ornaments of colored and gold initials, and various paintings. In that time, copies of literary productions were transcribed by professional copyists. Instruction was confined to a limited number, but it was with the highly valuable invention of Gutenberg in 1454, that knowledge could be spread amongst all classes. To illustrate the importance of that discovery, a complete printing office of that time was reproduced in the Exhibition.

Following this innovation, progress in the printing art seems to have been wonderful. The first news-

paper ever published appeared by the end of the 16th century. During the 17th century, engraving on wood was practically all replaced by copper engraving, a display of which appears in a shop window of an old Leipzig merchant of the "Hannan Court."

A special room was provided in honor of Breitkopf, the first to print the German types and the modern



The Hand-Made Process.

music notes. Some of the oldest editions of the German classical authors, Goethe and Schiller, published in the 18th century found interesting exhibits.

The next exhibit in the series were those of the modern times, with the inventions in the 19th century, of the mechanical press by Frederich Koenig, and that of lithography by Alois Senefelder. The press with which the London Times was printed for the first time November 29th, 1814, was reproduced by the firm Koenig and Bauer. Various documents were in place to show the whole history of commercial papers.

No visiting papermaker would fail to go through the old paper mill; a reconstruction with all historical fidelity, of an ancient manufacture of Hainsburg. There, the pulp was hammered with mechanical wood



The Old Paper Mill.

manets, the paper sheet formed by means of moulds, it represented the real "hand made" process of old. The paper was also printed with a press of the "Gutenberg" style. Also of great interest was the exhibit of the first paper-making machine for the production of a continuous sheet of paper, invented by the Frenchman, Henri Robert.

The last word of perfection embodied by a modern and complete paper making plant; improved Hollanders, and an up-to-date paper-making machine were to be seen at work, producing paper, which was printed in the next hall, by means of a rapid rotary press of the well known firm of August Scherl of Berlin. This shows the triumph of Industry, the victory of Science.

The visitor had the impression of living in a few hours the life and progress of the world, with the history of Graphic Arts.

I was told that the exhibition ground is part of the field which was witness of the great Leipzig battle of 1813. There the army of Napoleon was defeated by the Allies, whose number, it is fair to say, was twice that of the French force. A huge and costly monument commemorates that victory, which cost the life of over 100,000 men.

It is to be expected that with the perfection of modern arms, the battles of 1914 will show a much greater number of victims. These improvements are another but very different form, of progress and civilization.

THE CORNISH CHINA CLAY INDUSTRY

By W. TRETHEWAY.

The fears foreshadowed a short time ago as to the consequences that would ensue upon the china clay industry of Cornwall in the event of a European war, have unfortunately been realized. The home trade in china clay is comparatively small when it is considered that nearly one million tons are produced every year. As regards the trade to India and other Oriental countries, such as Japan, business has greatly increased in recent years, but this trade will be very precarious in consequence of the dangerous uncertainty of the sea routes to the Far East. The china clay trade to the continent has been enormous, and the declaration of war dealt it a severe blow. Russia and Germany were amongst the best customers of the Cornish china clay merchant. Of all the firms doing a continental trade, the West of England and Lovering and Co. were probably doing the largest. Hence they are affected to a greater extent than others by the sudden suspension. The financial aspect is also a serious matter, the Cornish clay merchants have to face, as it is computed that the Continent has invariably something like £100,000 upon the usual credit terms, and not only have shipments been suspended, but an enormous amount of money is held up, with no immediate prospect of payment for many months to come, if the bulk of it is ever paid at all. All over the mid-Cornwall china clay field, there are signs of the effect of the war, and it is most unfortunate that such a set back should occur so soon after last year's strike.

The outlook at the commencement was so unpromising that the West of England and Great Beam China Clay Company, which employ about twelve hundred workers, decided to close down the whole of their works. Fortunately, the situation has so improved within the past few days that the West of England Company has undertaken to find employment for their married workers throughout the war. This will mean that the company will at a great sacrifice of £800 a week, provide employment for the whole of their married men, not in producing clay for shipment, but simply on development, a good deal of which could be in the ordinary way distributed over many years. This arrangement is essentially a special one, and has given considerable gratification in the district. It affects nearly 800 men, and as far as the single men are concerned, they must seek other spheres whilst the war lasts. The one bright factor in the industry, which is raising the hopes of those vitally con-

cerned is the present activity of the American and Canadian markets. Whether this activity will be continued or only the result of the natural foresight of our customers to stock clays now the Atlantic routes are clear in case of any future eventualities. The fact remains that Fowey, the principal Cornish shipping centre, is once more throbbing with activity and the large direct steamers are carrying away their burdens of 6,000 tons and upwards.

Through the necessity of draught horses for the army remount department the china clay carriers have lost some of their finest specimens, and nearly 200 horses have been accepted for heavy draught artillery work. The patriotic spirit of the carriers was commendable, and in the early stages of the war, as the carriers proceeded through the town of St. Anstell with their teams drawing their usual loads of about 5 tons, those animals which came up to the standard, were willingly unharnessed, and in many cases with an affecting farewell, for the clay carrier loves his horses, and keeps them well.

In conversation with one of the most prominent clay merchants of St. Anstell, I was informed that the declaration of war brought an immediate cancellation of shipments on the one hand and remittances on the other. That stoppage will be continued as far as the continent is concerned is apparent, but it is exceptionally unfortunate at this time of the year when larger quantities are being sent there, especially to Russia, where several ports are closed during the winter months. It is very gratifying to learn that arrangements have been made for promptly resuming shipments to America, our largest single customer. This will allow for the continuous employment of a very large proportion of the men, and in due course money will again flow into the district. It is possible that England and America will have to a very large extent to provide for a time the wants of the world for paper. Certain qualities of clay, which have been used by Russia and Germany will probably suffer a serious decline in value, and these clays may have to be sold at a moderate price. The moratorium is being availed of in many districts and it is quite uncertain, of course, when large amounts are owing from Germany especially, and Russia and Belgium to a less degree, will be paid. In all probability, France and Holland will make good in due time. On the whole, the industry will continue to afford a reasonable livelihood to

those engaged in it. The new uses for china clay are being so continually extended that no substitute either in matter of price or suitability has been, or is likely to be, discovered, and provided the ocean is kept free, the world will be able to get its supplies of Cornish clays with only the extra war insurance added. The Government measures for securing financial stability and for assisting marine insurance have been especially welcomed in the clay district, where on the one hand a fairly long credit is given, and on the other practically all the production is exported. There has been a very good spirit of mutual helpfulness in the trade, and there is every reason to believe that employers and men will continue to gain a honourable livelihood.

The Shake

By B. Arnould.

The shake is the method by which the felting of the pulp fibres, effected by hand in the days before the paper machine was invented, is caused during the passage of the pulp over the Fourdrinier wire.

Hand-made paper is preferred to mould-made paper because the shake is given by the hand of the workman. The wielder of the hand mould is an artist, skilled of hand, and keen of eye, especially if he makes water-marked paper for banknotes and other papers of value.

The oscillating table of the paper machine shake is intended to imitate as far as possible, the movements given to the mould by the hand and wrist of the coucher. It is necessary to regulate the position of the fibres while they are draining, so as to accelerate or retard the separation of the water, and to give the sheet a uniform thickness and very nearly the same strength in every direction.

Many forms of apparatus for regulating the reciprocating movement of the shake, and they have been greatly improved of late years, without however succeeding in equalling the work of the hand. All reciprocating mechanism imparts to the table, which has considerable weight more or less violent shocks succeeding one another without interruption at the rate of 200 to 300 per minute. This is done by means of connecting rods, cranks, friction discs and other contrivances. The shakings are not rhythmic. For the most part they are abrupt shocks as the table is thrown first this way and then that without ceasing. The effect is greatly assisted by the reaction of the rest of the machine, which produces counter shocks as they resist the movement of the table.

The great difficulty has always been to get uniform strength of the web. With some cases it is difficult to get the transverse strength more than half the longitudinal strength. M. M. Thiry and Co. have invented a new reciprocating mechanism, which is said to shake without abrupt shocks. It is made on the principle of utilising the centrifugal force obtained by a revolving motion. In this way greater simplicity of construction is attained, and roll-axes and bearings are saved much wear and tear.

The apparatus is fixed at the end of the head of the machine, is in one piece with oscillating table, and can be adapted to a table supported like the hanging table.

Speaking of the hanging table, the writer wishes to say something about the difficulties he has encounter-

ed in making certain fine papers required of exceptional strength. It was on a modern machine with the table suspended from above, and provided with every improvement known at the time. The felting was different at the edges of the web, and the fault showed itself from right to left and vice versa, although the pulp was flowing on to the wire with perfect uniformity. The result of the difference in the felting was that the tensile strength of the web varied from 25 to 30 per cent from one edge to the other.

The writer arrived at the following explanation. In the first place, it seems that the hanging table should obey the law of gravity, which law should rather be an exception when it is a question of the construction of metallic masses of this importance.

To take advantage of the supposed advantages of the gravity of bodies acting as pendulums, to maintain the equilibrium of the table and from movements of the table even transversely, and to lighten the effect of the constant action of the mechanism giving the reciprocal motion which has to overcome the inertia of the motion in the opposite direction, makers of machinery have been induced to re-establish automatically the displacement of the oscillating table from the direction of the web by means of springs for example. Without any change in the flow of pulp on to the wire, the least pressure exerted on one side on one of the springs, would reverse the functions (roles), and the lessening of the strength of the paper would be immediately transferred, entirely or partially, to the other edge of the web.

Guided by these practical and mathematical data given by the dynamometer, the writer thought he had to seek a point, and he sought for it in vain in the course of several makings of very strong papers which had to have a mean breaking length of 1,500 metres.

When after various attempts he arrived at satisfactory data, and at almost identical tensile strengths, he thought that the head of his machine was at last in order, but he was quite wrong. A change in the reciprocating motion, necessitated by differences in the length of the fibre or in the greasiness of the pulp, brought back the same old difficulties in the variations of strength from one edge of the web to the other.

Never, so far as he knows, has the writer had such trouble with tables supported from below, unless undue wear had caused the table to deviate from the horizontal. He infers that the suspension of the table from above is not an improvement, at least as regards the making of fine papers. He lays no particular stress on the increase in working expenses due to the hanging table, or on the wear and tear of bearings and axles, despite the employment of buffers, or on the wear of the wire due to shifting of the bearing rolls.

Progress does not consist in absolute rejection of an instrument with the idea that those who have hitherto used it were fools and without proper knowledge of their business. All experience is derived from the collation of the most varied labors by the association of ideas which is born of the knowledge of a very large number of practical facts.

This is why the writer applauded, personally, the patented invention above alluded to. This invention, inspired by practical experience, allows of the construction of a table both suspended and supported, to avoid the difficulties above mentioned of the table simply suspended.

The combination of the two principles permits of the construction which is strong, equilibrated in all its

movements according to the law of gravity, and according to the particular necessities of the manufacture of fine papers, for which the perfecting of the plant is so necessary. The principle appears to indicate a priori. Le Papier.

Ottawa Notes

Low water is the problem which is facing pulp and paper manufacturers in Ottawa district just at present. The demand for newsprint having proved the silver lining to the war cloud for the trade, manufacturers were beginning to take a cheerful view of things in general but the rapidly dropping level of the Ottawa river has placed matters in a different light. The pulp and saw mills of the J. R. Booth Company were closed down over a week ago owing to this cause and about a thousand employees were thrown out of work. Although half of these men have been taken on again it is problematical whether the remainder will be placed again this summer.

The Booth Company closed down its plant when the water became so low that to continue operating at full time would have affected the capacity of the city waterworks. Arrangements were made, however, for the operation of the two pulp mills from 12 o'clock at night until 6 o'clock in the morning. The paper mills are run by steam engines and are thus able to operate continuously. The company will probably have to purchase pulp from outside sources to furnish raw material for the paper mills. However, the rainy weather during the past week has improved the situation somewhat and it is hoped that if it continued it may even be possible to operate the pulp mills once again at full time and to reopen the saw mills. Other lumber and pulp and paper firms operating on the Ottawa have been more or less affected by the low water and scarcely any of them are operating at full capacity in spite of the demand and high prices paid for pulp and paper.

According to Mr. Jackson Booth, of the firm of that name, the outbreak of war has cut off the whole export trade of the company and no pulp or paper has been shipped anywhere since the situation first developed. The paper which is being manufactured outside the local and American demand is being placed in stock.

Mr. W. H. Rowley, general manager of the E. B. Eddy Company, says that from the outlook of things at present business with his firm will be continued as usual procuring the necessary raw materials such as metals, clays, chemicals, colors, etc., many of which were imported from foreign countries, are still obtainable. However, prospects are that no serious inconvenience will be caused and consequently the staff now employed is not likely to be reduced.

Pulp and Paper Possibilities.

The possibilities for Canadian pulp and paper manufacturers that are presented by the present war situation are being made the object of exhortations to the trade by the Trade and Commerce Department. Sir George E. Foster, Minister of Trade and Commerce, last week issued an appeal to Canadian manufacturers to win a bloodless but effective victory by availing themselves of the advantages of present con-

ditions and capturing the markets hitherto held by Germany.

In the pulp and paper field Sir George Foster's remarks are pertinent. He states that "Germany is a great paper exporting country, her shipments to Canada last year amounting to \$350,187. Now that Germany can no longer ship paper overseas the Canadian paper industry should be in a position to supply a large part of the above amount. Packages and parcels were also during the same year purchased from Germany to the value of \$160,659." A statistical presentation of Germany's exports of pulp and paper to Canada show that in 1914 she sent the following: \$7,987; ruled, bordered, coated and boxed papers and papereries, \$23,678; wrapping paper \$17,341; other paper, \$269,326. In 1914 paper to the value of \$25,228 was also imported from Austria-Hungary.

On the other hand the United States, through the anxiety of her own paper manufacturers to capture the German trade, will present a splendid market for Canadian pulp, both groundwood and sulphite. A large number of the United States mills have depended entirely for their supply of the raw material on Canadian and European sources. With the latter cut off they will have to depend on Canada. It has been estimated that at least a hundred mills depend wholly on European pulp and as the supply in the United States is already taxed to the utmost, these will now have to look toward Canada for the product or close down. All this means a harvest for Canadian manufacturers.

Forest Protective Association.

The splendid work which has already been accomplished by the Lower Ottawa Forest Protective Association and the growth of the idea as shown by the number of new members who have joined is evidenced in a statement presented as to the progress of the Association. The area of timber limits protected has grown from about 9,000 square miles to 11,812 or 7,500,000 acres. Forty-nine permanent rangers under a manager and four inspectors are permanently employed and these in turn employ temporary help when needed. Forty convictions of settlers for starting fires without a permit have been secured, and it is expected this class of timber fires will be more rare from now on. It is expected that the results already secured by the recently organized Lower Ottawa Association and which have for some time crowned the work of the premier organization, that in St. Maurice Valley, will be followed by the establishment of similar associations in other parts of Eastern Canada.

Fraser Lumber Co. Will Not Remove.

The Fraser Lumber Company, which operates extensive lumber mills at Deschenes, near Ottawa, and possesses large limits of saw timber and pulpwood, will not remove its mills to the Hurrieanaw district, as was announced some time ago. Officials of the company state the plant will not be moved from this district in the next five years. It is learned, however, that Mr. F. A. Gendron, M.L.A., who is associated with the Fraser Company in their recent acquisition of valuable timber and pulpwood berths in the Hurrieanaw district, is now erecting a large sawmill on the limits which has done away with the necessity for the transfer of the Deschenes plant.

Notes.

The action of the legislature of Newfoundland in passing an act allowing the export of pulpwood in

manufactured from Newfoundland and Labrador, hitherto prohibited, will somewhat relieve the situation, it is expected.

Of some interest in the present situation is an official statement of the trend of prices in Canada at present issued by the Labor Department for the information of the public. After pointing out that the cost of living in the Dominion has not gone up greatly as a result of the war, it states in regard to paper that news print is higher on account of the demand and that caustic soda and some other chemicals used in paper manufacture are also higher in price.

A number of shantymen and workers in the pulp and paper mills around Ottawa have caught the war spirit and enlisted. Three citizens of Hull, who are employed in the pulp mills of the E. B. Eddy Company are among this number and the Eddy firm, as is case with most of the others in this district, has announced that their places will be kept open for them and their families assisted throughout the war. Some of the shantymen who have applied for enlistment stated they had only heard of the war a week or two ago, and had immediately left to become recruits. MAC.

EUROPEAN WAR PRICES IN GREAT BRITAIN

Shipments of Pulps Reduced and Paper Prices Advanced.

—From Our London Representative.

When questioned as to possibility of the threatened "world's famine" in paper, a well-known pulp and paper man in London said, "The 'famine' may apply to America (thanks to her tariffs), but you know as well as I do there are no complaints to be made. We have the paper stocks, and thanks to the British fleet, we can get the pulp from Scandinavia and Canada, with the ready money in our hands. That is British policy in wartime."

Now, I am of the opinion these few remarks about sum up the present position of the pulp and paper trades. New business in pulps is in most cases paid for on spot and millowners say their position in the paper industry is not so bad as was first anticipated, though there might be a few exceptional cases, particularly in Scotland.

Paper Prices Advancing.

Amongst the Scottish paper manufacturers, who are interested in *esparto*, some difficulty is experienced in obtaining supplies of the raw material, and Messrs. Idd and Christie, the well-known fibre importers, and Messrs. Morris, report that business is practically at a standstill and much anxiety is felt as to shipments from the foreign ports against contracts. These shipments have considerably reduced since the European war broke out, and consequently there is great anxiety on the part of the Scottish papermakers to meet the wants of their numerous customers. They are, therefore, trusting to their stocks holding out, and a supply of *esparto* in the near future to meet their obligations.

In other classes of papers the demand is good. Old stocks are being sorted out and a kind of stocktaking is in progress. I saw one newspaper office bring out close on 300 tons of newsprint that it had stored away in one of the most fashionable and business parts of London. The paper had a damp smell when turned over in the dark store, but otherwise it presented a fair appearance, and was quite suitable for the busy newspaper office where thousands of copies are turned out in the half hour. People in England have not the time to consider the quality of paper now—they want to know how the events are going on the Continent, and what the banks are doing. Paper is a secondary consideration, though we are running our business on it, instead of the proverbial sovereign or gold half sovereign. But if a census of the

production and consumption was demanded to-day, I believe we could get it with great accuracy. In America, I notice, a census of production of papers in Great Britain can easily be produced for publication; but it is a remarkable fact that no correct census of production or of consumption can ever be obtained in London. The London paper men does not live in a fool's paradise, from what I can learn of him. Because there is a European war raging over his head he has not rushed up prices of his papers. He is going steadily on with his work, attending to his contracts and his customers, who, as time goes on, are gradually acquainted that prices must inevitably rise to a higher basis. By this means the British paper manufacturer, without surprising the market, is gradually achieving his object, and the Trade Board is dealing with the foreign competitors.

There is war with arms, and now there is war in trade, but not so openly as it is done with firearms. So that the British paper manufacturers is getting over the shock he received when the war first broke out, and how long he may continue in his present sphere it is difficult to say. Newsprint is going at 4 cents, in some cases at 3 cents per pound. The German, Austrian and Swedish papers of all classes, kraft, etc., are receiving a severe shock and the British newsprint mills are busy. It is true that about 50 newspapers and publications have ceased to exist during the war, but this factor only stimulates the feeling for the British and Canadian products, and the British and Canadian mills. Therefore, if there is any surplus papers in Canada, London is the place for them, with a fair price tacked on. Newfoundland is already busy in connection with the London trade and there is no reason why Canada should not be.

Unfortunately the vessels trading between Norway and one or two other Scandinavian ports are meeting with the German mines on the sea routes. One of the London evening papers lost 200 reels the other day in one of these sunken vessels, and another steamer went to the bottom with about 150 tons of paper—all newsprint, which is peculiarly valuable at this critical period. The British Admiralty now say that voyage may be undertaken except to Holland, Denmark, Germany and Sweden, the Russian Baltic ports and Adriatic ports. There is also a risk in entering the London port and the east coast of England ports

at night. In this great crisis the government is naturally working at full pressure. They keep printers at their posts night and day, which is good for the paper mills, and they are also making big demands on the paper manufacturers and their agents.

No Market For Pulps.

There is no market for pulps. That is the position of affairs. Here are some of the quotations of the last day of August:—

Sulphite Bleached (No. 1)	\$72.00	to	\$87.00
Easy Bleaching No. 1	25.00	to	26.00
Sulphite news	48.00	to	48.50
Ground Wood, moist	14.40	to	14.80
Ground Wood, dry	24.00	to	26.00

For all new business cash must be paid against documents. The pulp men in Manchester, like those in London, are wondering what will next happen. In fact, I heard of one the other day who could not even cash his new one pound notes issued by the government in order to obtain the coin of the realm to pay his office staff. If this is the case with pound notes, what will business be like in the pulp trade? However, as a man said to me the other day, there is pulp for everybody if we pay for it. It will be borne in mind that the shipments of pulp to England were very fair before the war broke out. Since the war, the London Custom authorities have informed me that the following were the imports:—

First Week of War.

	Tons.
Bleached chemical dry	555
Unbleached chemical (dry)	6,084
Chemical wet	10
Mechanical, moist	9,034

Of the mechanical, 3,910 tons came from Canada. All the other pulps came from Sweden, Norway, Denmark and a little lying on board ships from Germany and Austria.

Second Week of War.

The second week of the war, which was after panic week had passed away, the arrivals of pulps were:—

	Tons.
Chemical dry	60
Unbleached chemical (dry)	2,925
Mechanical, moist	837

All arrivals from Sweden, Norway and Portugal. The arrivals following were for the

Third Week of War.

	Tons.
Bleached chemical dry	80
Unbleached chemical dry	994
Mechanical, moist	10,993

Of the mechanical, 6,327 tons came from Newfoundland and 3,866 tons from Canada. So gauging the position during the first three weeks of the war, the state of things is not so bad as was first expected.

Chemicals.

Chemicals, of course, are dearer and so are fillings and loadings. Canadian papermakers are enquiring about makers of caustic soda and other chemicals in addition to those in England. All they have to do is consult the Pulp and Paper Magazine for the information or address the enquiry to me through the editor of the Pulp and Paper Magazine. Bleaching powder or caustic soda is falling and rising so rapidly that it is difficult to give a quotation. The same is true of most chemicals. There is no shortage as yet, the cutting off with Germany has given some an impulse.

Canadian Pulp Possibilities in China

Dr. J. W. Ross, Canadian Trade Commissioner at Shanghai, China, has made an interesting brief report on Chinese pulp and paper conditions. He says that the importation of wood pulp into China is not a large business, nor does the demand seem to be increasing. The importations for 1913 were considerably in excess of those for 1912, but then again they were less than the total of those for 1911, so the consumption of wood pulp for the three years 1911-12-13 one with another average practically the same figures.

For the three years considered, China imported wood pulp to the amount of:—

	Tons.	Valued at.
1911	2,800	\$84,595
1912	1,526	47,303
1913	2,442	72,139

The Chinese are said to have been the first people to manufacture paper, and so for many hundreds of years and through thousands of generations, the business has been carried on until the manufacturers, although working under the most primitive of methods, have been able to bring their products to wonderful perfection. Thus it is that it is only in the manufacture of paper for foreign newspapers and for books printed in foreign languages that foreign made paper is employed, and much of this imported from other countries.

Of the total amount of wood pulp annually imported, about half is Scandinavian pulp. The prime reason for this is that the agents for the principal foreign paper mill in China is a Danish firm with important commercial connections in Denmark, Norway and Sweden, so the bulk of their orders go to that part of the world. Germany has also during the past five years supplied a fair proportion of the amount imported. While Canada in 1912 sent only about 1,200 lbs.

The agents for the Paper Mill Company above mentioned placed an order last month for Scandinavian pulp as follows:—

450 tons mechanical at £5 10s per ton C.I.F., and 200 tons strong sulphite at £7 7s.

This company import about 800 tons of pulp per annum.

The above figures show that a fair amount of wood pulp comes annually into this country, and the amount may possibly increase. It would, therefore, be well for Canadian manufacturers to supply the Canadian Trade Commissioner with samples and prices of their products to enable the latter to introduce the article should occasion arise.

BATHURST PULP MILL EQUIPMENT.

The Bathurst Lumber Company has been letting some contracts for equipment for their pulp mill. What will be the largest board machine in Canada, 136 inches wide, with 77 driers, will be supplied by the Black and Clawson Co. The same firm will supply also sulphite drying machine of 31 driers, 100 inches wide. The boilers for the plant will come from Scotland, to be supplied by the Babcock and Wilson Co. The steam turbines and generators will be furnished by the Westinghouse Co. The barking drums will come from Wm. Hamilton and Co., Peterborough, Ont., and the digesters from the Portland Co., Portland, Me. The Watsons Engine Works will make the stacker, slasher, log jacks and flat screens. Boving and Company of Canada have received the order for the chipper, rechipper and chip screens.

UNITED STATES NOTES

Special to Pulp and Paper Magazine.

The New York Consolidated Card Co., now located on West 14th Street, New York City, are in the throes of moving. Their handsome new building at the corner of 4th and Webster Avenue, Long Island City, has been completed, and the firm expects to be completely moved there within the next two weeks.

The St. Regis Paper Company of Watertown, N.Y., has been made defendant in an action brought by Toney Spirka, a former employee of the company, in the amount of \$10,000 for damages on account of injuries received last May at the defendant's mill at Deferiets. The plaintiff alleges that on May 29, while he was engaged in repairing, taking out or turning over a part of a paper machine, a blanket felt or screen, the machine was started and his left arm was drawn into the machine, broken above the elbow and otherwise badly bruised. He charges that he was provided an unsafe place to work and that the machine was started up under the direction of some one in charge.

The plant of the Aldrich Paper Co., at Natural Dam, N.Y., is once again in operation after having been shut down for a period of five weeks for repairs. Two new water wheels have been installed in the pulp grinding department, and the old machinery has been overhauled and repaired. The sulphite department reopened last week. The company has an unusually large number of orders on hand, and it is expected that a very busy winter in the newsprint line is assured.

Superintendent O. F. Dodge of the Taggart Paper Company mill at Great Bend, N.Y., while down in the beater room wheel pit, one afternoon several weeks ago found a watch which he lost about 12 years ago. Every time when the mill has been down for repairs, and when he would be down in the wheel pit he would think of his watch and would make a search for it, but without success. Thursday, however, while in the pit and not thinking of the watch, he placed his hand on a ledge of rock and right on the watch. The cases were a little darkened, and nearly all the works had rusted away.

Upper Mill No. 2, known as the "brick mill" of the Onondaga Paper Company, on Nine-Mile Creek, between Marcellus Falls and the village of Marcellus, N.Y., was badly damaged by fire at 2 o'clock one afternoon last week. The entire south end of the building, in which were the unfinished stock and beater rooms, and the boiler room, was burned, and the contents, with the exception of the machinery in the boiler room, was practically destroyed. The roof of the boiler room was burned off and the room flooded.

A fire of unknown origin started in the stock shed of the Tonawanda Board and Paper Company at Tonawanda, N.Y., last week and was fought by the fireman for several hours. L. C. Newman, president of the company, said that the amount of damage could

not be ascertained at this time, as it would be impossible to get at the stock until it dries out some. The stock was flooded by the large amount of water turned on it. Mr. Newman said that he thought the fire started from some persons smoking in the place. The structure and contents were insured.

Remarkable progress is being made in cleaning up the wreckage at the plant of the Eddy Paper Co. at White Pigeon which was recently partly blown down during a storm. It is the desire of officials of the company to rush this work just as fast as possible, and plans are now being considered which will permit the early operation of the mill. It is probable that a temporary wall will be erected and only a temporary roof put over the machine room so that the paper machine can be placed in operation at the plant. The men now engaged in doing the repair work are the regular employees of the mill. The damage, it would be a week ago, going nearly to \$75,000.

The new and complete list of officers of the reorganized Brunet Falls Manufacturing Company of Cornell, Wis., now known as the Cornell Wood Products Company, was announced last week as follows: C. O. Frisbie, president and general manager; O. M. Gordon, treasurer; W. G. Saville, secretary and sale manager; E. W. Cowell, assistant sales manager; superintendent, Duncan L. Leslie; assistant superintendent, Ernest Beyers. The plant is again in full operation. Sales offices have been opened in Chicago.

The Interstate Commerce Commission has dismissed the complaint of the Rhineland Paper Company against the Minneapolis, St. Paul and S. S. Marie Railway Company, adhering to the conclusion of the original decision. The traffic involved in the complaint was that of the transportation of pulp wood from named points in Michigan to Rhineland. The reductions asked for were as follows: From Tredary from 6c to 3.65c; Delta Junction, 6c to 3.80c; Manistique, 6c to 3.80c; Whitdale, 7.5c to 3.80c; Boyce, Christiansen Spur and Spur No. 447, each, from 7.5c to 4.10c. These rates were the ones in effect from Minnesota points to the same destination, and were similar to the rates established by the Wisconsin Commission.

Warrants are out and several detective agencies have been engaged to look up Carl H. Baker, confidential clerk of the Great Northern Paper Co., at Boston, Mass., charged with the forgery of a check for \$3,260 and said to be short in his accounts about \$7,000 besides. About a month ago he asked for a two week vacation, which was granted. When he did not return when expected, his books were examined, and it is said many false entries and shortages were discovered, also that he had forged a check for \$3,260, made payable to F. A. Gilbert, of Bangor, superintendent of the spruce wood department of the company, which Baker cashed at a Boston bank without question, as he had been in the habit of handling cash for the office.

At the same time Baker left town a young woman employed in a photograph studio, to whom he had been paying attention, also disappointed.

Baker has lived all his life in Brewer, where he graduated from the Brewer High School and a business college. He had been employed by the Great Northern Company for some time and considered a capable employee.

The Continental Bag and Paper Company in Watertown, N.Y., has about completed the addition to its mill in Water Street, and the machinery is already being installed. The new building is of three stories, and a basement, and is constructed of brick. H. J. Wright is the contractor for the building, and it cost about \$20,000. Heretofore the local paper company, which is engaged in the manufacture of tissue paper, has shipped the manufactured article to Boston and other cities to be cut and packed for the retail trade. In the new building will be placed machinery for doing this latter work and the finished article will now be prepared in Watertown. It will doubtless furnish work for more men than formerly.

A force of men is now engaged getting the paper machines in the Allen plant of the Union Bag and Paper Company's mills at Hudson Falls, N.Y., ready for operation. When the machines were closed down a number of months ago, the felts, wire, etc., were removed. It is believed that three of the five machines will be ready for operation this week. Superintendent Fox states that the former employees of the company will be given their old jobs back if they desire to return. The resumption of the Allen plant will mean employment for about fifty men.

The Martin Pulp and Paper Company of Norfolk, N.Y., has filed in the United States Court at Utica a petition in voluntary bankruptcy and Orrin E. Martin, of Norwood, N.Y., has been appointed receiver with authority to conduct the operations of the mill until such time as his services are no longer required. Among the creditors filing the petitions were the Citizens' National Bank of Potsdam, a creditor for \$13,000, the People's Bank of Potsdam, for \$1,000, and the Raquette River Paper Company of Potsdam, for \$4,000, all secured. According to the creditors' petition, the pulp and paper business conducted by the corporations is fairly remunerative because of the present market conditions. In appointing the receiver, Judge Ray gave authority for the operation of the plant until a further order of the court or further action that be taken by the creditors, unless the bankruptcy proceedings are settled. While the above-mentioned creditors hold a total amount against the paper company for upwards of \$18,000, they are all secured by first mortgage bonds of the company, notes and other securities. Their charge as the act of bankruptcy that on July 22 last the company permitted a French bank to secure a preference for \$1,652 under a court order.

There is also an expression of alarm in some quarters in this large paper manufacturing center as to just what will be the outcome of the advanced cost of production. While the prices are soaring upwards and the price of materials is also following upwards, there are very many of the local concerns who will not be in a position to immediately take advantage of the higher market on account of long period contracts. It is believed by some that the present

situation is going to work a hardship in this respect.

It is alleged in the petition for the appointment of the receiver that the assets of the company include a rights and mill equipments valued at \$2,500. There is machinery of the value of \$45,000; belting, supplies, etc., \$50; pulp wood in cars, \$700. There is no estimate of the liabilities of the company. The mill has been in operation for the last two years and there is a quantity of raw materials now on hand which it is claimed could be marketed profitably because of the condition of the paper and pulp market. It is also urged that it is for the interests of all the creditors that the property of the company should be kept on a live basis, and that the plan should not be closed down.

While there was nothing in the papers filed against the company showing that a reorganization of the company will follow, it is believed that this course will be taken.

The sales of the Canadian timber lands and the logging mill of the bankrupt Battle Island Paper Co., will be held up for several weeks or months' longer, although all but one or two of the creditors interested voted the price of \$300,000, offered by the Ontario Paper Co. of Thorold, Ont., to be satisfactory. This statement was made by William P. Gannon, attorney for the trustee of the Battle Island Co., who has just returned to Watertown, N.Y., from Quebec, where meetings of creditors and of the liquidators have been held.

"With one or two exceptions," Mr. Gannon said, "the creditors believed that the \$300,000 offered by the Ontario Paper Co. in Syracuse, recently was satisfactory. Certain creditors, however, raised objections to the legality of the meeting held at Chicoutimi a week ago and other objected to the proposed methods of distributing the proceeds of the sale among the creditors.

All of these questions will have to be argued before the Superior Court of the Dominion of Canada at some time not yet agreed upon, but which it is expected will be within a few weeks. We will be given notice and will appear at the argument.

The objections raised by the creditors who took a stand apart from the others were of a general nature and contained no detailed statements. When the matter comes up for argument they will be compelled to file specific statements showing on what their contentions are based.

It is probable that the objections relating to the legality of the meeting will be brushed aside and that plans will be made to carry out the terms of the sale. More than \$1,000,000 was represented in the voting at the meeting last week. The meeting was one of both United States and Canadian creditors. As soon as the Canadian situation is cleared up an application will be made to Judge Ray for an order to dispose of the sulphite plant of the Battle Island Co. at Fribourg, the water rights, etc.

The reduction of the tariff as far as the paper mills are concerned does not mean in all cases that the mills receive the entire benefit of the reduction. The wood pulp used by the Holyoke, Mass., mills of which a large amount is reported had a tariff reduction of one-fourth of a cent per pound, said a prominent manufacturer of that city last week. "but of this reduction the paper mills lost a fraction, as the price was raised by the importer to cover a fraction of

the drop. It is also understood that in some other paper mill supplies where there was a drop in the tariff that the price was raised across the water to practically take up all the profit of the drop, so that the local mills did not get the material much cheaper than under the higher tariff. It is probable that this ought to make the lowering of the tariff popular across the water. However, if the local mills can get the raw material with which to work at the present time they ought to be able to get back at some of the European countries, where paper has taken a great advance, by boosting up the price of paper exported from this side, and with a paper shortage across the water already reported the paper manufacturer here should find a ready sale.

Wood Pulp Industry in Sweden

The United States Consul at Göteborg, Sweden notes that the value of the wood pulp produced in Sweden increased from \$938,000 in 1886 to \$30,000,000 in 1912. In 1912 there was produced in the country 1,556,499 metric tons of pulp, of which 41 per cent was dry chemical, 23 per cent moist chemical, 32 per cent moist chemical, and 4 per cent dry mechanical. Last year there were exported 1,007,457 metric tons of pulp from Sweden, of which 177,677 tons were from Göteborg. The wood pulp invoiced for export from Göteborg to the United States in 1913 was valued at \$2,083,141, or \$93,610 less than for 1912. Almost all of the pulp shipped from this port to the United States is the dry chemical product.

Prices of wood pulp fluctuated considerably during the year. The level of prices was rather high at the beginning of the year, but declined toward the close of the year. The price of strong bleached chemical pulp sold for \$38.86 and \$39.93 per metric ton at the beginning of the year, declining later as low as \$34.84 but rising again to \$37.52. Easy-bleached chemical pulp sold for \$42.88 per metric ton, but fell later as low as \$37.52. Bleached chemical pulp sold for \$33.60 per metric ton. Comparatively little of the latter pulp is produced in Sweden. Separate pulp, easy-bleached and strong, seemed to be most in demand.

Prices of mechanical pulp were low, but increased somewhat in the autumn. Prices of moist mechanical pulp varied between \$7.50 and \$8.58 per metric ton.

The paper industry has advanced considerably during the last thirty years. In 1912 there were produced 278,984 metric tons of paper valued at \$15,706,190, and 38,554 metric tons of cardboard, pasteboard, etc., valued at \$1,483,149. Over one-half of the paper produced was cartridge, packing, and other heavy paper, and over 40 per cent was writing, document, printing, and other paper not gilt, silvered, or gilded. The production of high-grade papers is therefore comparatively small.

The exports of paper and pasteboard from Sweden in 1913 amounted to 211,569 tons, of which 150,287 tons passed through the port of Göteborg. About 85 per cent of the exports consists of heavy packing wrapping, and printing paper.

The imports of paper and pasteboard into Sweden consist mainly of high-grade writing paper, parchment paper, colored paper, and certain special grades of paper board.

Kraft Outlook Bright

Since the outbreak of the war the price of extra strong kraft pulp has been advanced from \$37 to \$47 per ton, delivered, and the Dryden Timber and Power Co., Limited, Dryden, Ont., of which J. B. Beveridge is General Manager, is very busy. The company reports that their coal and chemical supplies are drawn entirely from Canada and that their manufacturing conditions will not be effected in any way. They have withdrawn all quotations and expect that, if hostilities keep up, the price will be increased by several dollars in the near future. Reviewing the present situation and outlook, Mr. Beveridge said: "In my opinion, the supply of chemical pulps cannot satisfy the demand for same in the United States, until the present war is ended, and the present prices we are receiving for our product will be maintained, if not increased, over the year 1915, for the following reasons. "The German and Austrian production of sulphite pulps is entirely stopped. The Scandinavian chemical pulp mills purchase a portion of their pulpwood supply from Finland, also they buy a portion of their chemicals and coal from Germany, the production of which is almost, if not entirely stopped. The Scandinavian countries, Norway and Sweden, have partly mobilized, which will result in the partial crippling of their industries owing to the scarcity of labor.

Even although Scandinavian mills are able to operate, it will be with a restricted output, and therefore an increased cost. Also after having manufactured their product, it is doubtful if the Scandinavian Mills will be able to make shipments to America for many months, owing to the difficulties of ocean transportation, in any case, they will have to pay very largely increased freight, insurance and exchange rates, before they can sell their product to American mills. This, of course, will maintain, and perhaps increase, present prices.

As the production of American and Canadian chemical pulp mills is only a small proportion of the total consumption, I am of the opinion that they will in future be able to secure a more equitable return on their investments which they have not been able to do in the past, owing to the competition of the European mills, with their over-production and lower cost of labor, chemicals, etc."

CANADIAN WALL PAPER IN GREAT BRITAIN.

Mr. Claude Dyer, Acting Trade Commissioner at Leeds, observes that it is interesting to note from the annual returns for last year that a small quantity of wall paper was shipped from Canada to this country. Local merchants who have visited Canada give Canadian manufacturers credit for the artistic and novel designs of the paper-hangings they produce. It is considered that in the cheaper varieties of paper there is but little opportunity for trade here owing to the high producing capacity of English mills, but in regard to the more expensive grades, however, it may be stated that regular supplies are imported from abroad.

Collier-Smith Limited, paper box manufacturers, 786 King Street West, Toronto, have removed to their new and well appointed factory on Portland Street, above Adelaide, which will greatly increase their capacity.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

Messrs. V. Trotter and Son, Ltd., of the Chirnside Bridge Paper Mill, in Berwickshire, have presented their 27th annual report, which shows that, including the sum £3,654 19s 5d brought forward from last year, less £300 voted at the last annual meeting for directors' fees, there is a balance at the credit of profit and loss account of £7,916 15s 4d. The directors say that in a normal state of affairs, they would have recommended the immediate payment of year's preference dividend, but a view of the great national crisis, they think it prudent that the actual payment of the dividend should be deferred to a date to be fixed by the directors in their discretion. The directors, therefore, recommend that the balance of profit, £7,916 15s 4d, be dealt with as follows:—To write off for depreciation £2,000; to pay as above a year's dividend of 5 per cent per annum on the 7,213 preference shares of £ each, £1,803 5s, less income tax, £105 3s 10d, leaving a balance of £4,218 14s 2d to be carried forward, subject to directors' fees.

The war has caused Messrs. F. Beckers and Co., Ltd., the London agents for the Chicoutimi Pulp Co., and the MacLeod Pulp Co., of Liverpool, to give Canada some attention for pulp, in common with other agents. Messrs. Beckers' Canadian-American branch is at present very busy dealing with orders and shipments. Two steamers are on their way to England with ground wood.

It is reported in London that some of the mills in north Sweden are in a bad way owing to the want of coal and water, in addition to sulphur. A general stoppage is expected. In Norway there is also a scarcity of coal, but every effort is being made to resume the shipments of fuel to Christiania. Mechanical pulp in Christiania is quoted at kroner 43 to 45, easy bleaching kroner 170 to 180. The prices of sulphite papers have risen from kroner 30 to 40.

The Trade Board in London are busily engaged with the paper mill owners in working up statistics and particulars as to markets supplied by the Continental countries at war. Their sole object is to capture the German and Austrian markets in foreign and colonial possessions, and this is partly to be dealt with by means of tariffs. In all markets where British mill owners enjoy a preference tariff, Canadians would see that they get the same as their British rivals. This will be done if application is made. Based on the Decision and, if possible, the Paper Mill Pulp Association should be asked to back up the proposition. Now is the time to move.

Pulp producers in Sweden report that owing to the mobilization of the army the mills have been deprived of numerous employees. The production of pulp is therefore limited, and stocks at present are not very large. Operations on a large scale are being

made by people in England and the United States and prices have advanced all round. Shortage of water and the question of the supply of coal in the near future, are two outstanding factors that are causing considerable uneasiness in the mills.

The war in Europe has disorganized the china clay industry in England, but it is gradually recovering. The American demand is active and numerous enquiries are also being made from Canadian sources. The great difficulty experienced by exporters of china clay and paper in England is the slowness on the railways which are at present in the hands of the government for military purposes.

The large imports of paper from Germany into the United Kingdom will now be entirely checked. Apparently the trade for some time past has been profitable. According to the British Consul at Leipzig over-production has brought the German cellulose paper factories into a very unhealthy state. Cellulose was originally supplied by certain firms to the paper factories, who only made their own cellulose in exceptional cases. In more recent times, however, the cellulose manufacturers decided to try to increase their profits by erecting their own paper mills. The result is seen in the fact that only three of the thirteen factories in Germany producing solely cellulose paper are paying—or were paying—dividends. Those paper factories which were run independently of a cellulose factory use comparatively smaller quantities of cellulose than formerly and they evince no desire to purchase cellulose from those factories which have become their greatest competitors, a fact which, of course, reacts unfavorably on the latter. Germans will now cease to get wood from Russia, and the prospects of the Teutonic mills are not very rosy when peace is declared.

The Prince of Wales, National Relief Fund in London to alleviate the poor and distressed during the war has been enriched by \$48,000 from the Kellner-Partington Paper Pulp Co.

Swedish exports of paper in June fell to 12,929 tons, compared with 15,513 tons in June, 1913.

Sir John Brunner, head of Brunner Mond and Co., papermakers' chemical suppliers, says in regard to the war: "The fact of the matter is trade will be thrust upon us." He admits we cannot touch Germany in the production of dyes.

TIMBER LIMITS PURCHASED.

The timber limits at Ha Ha Bay on the Saguenay River, formerly owned by the Battle Island Pulp Co. of Fulton, N.Y., have been purchased by the Ontario Paper Co. of Thorold, Ont., the figure being around three hundred thousand dollars. It is understood that twenty-seven thousand acres are freehold and one hundred thousand acres are leasehold land.



NEW PATENTS



PEELING MACHINE FOR WOOD LOGS.

Anders Nicolay Andersen, of Hongsund, Norway,
Patentee.

Patented Aug. 4, 1914, in United States Patent Office.
1,106,177.

In describing his invention, the inventor says:—My invention relates to improvements in log peeling machines of that class wherein a rotating cutter is used for peeling the bark from the log.

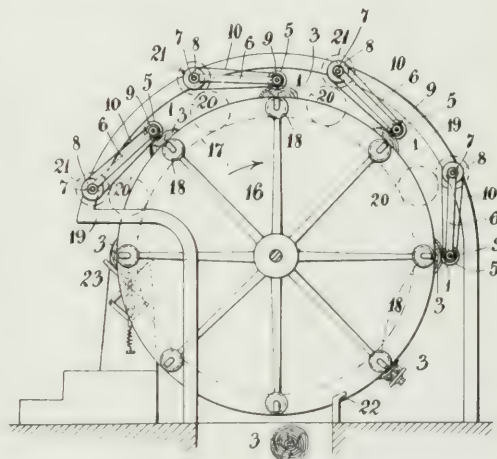
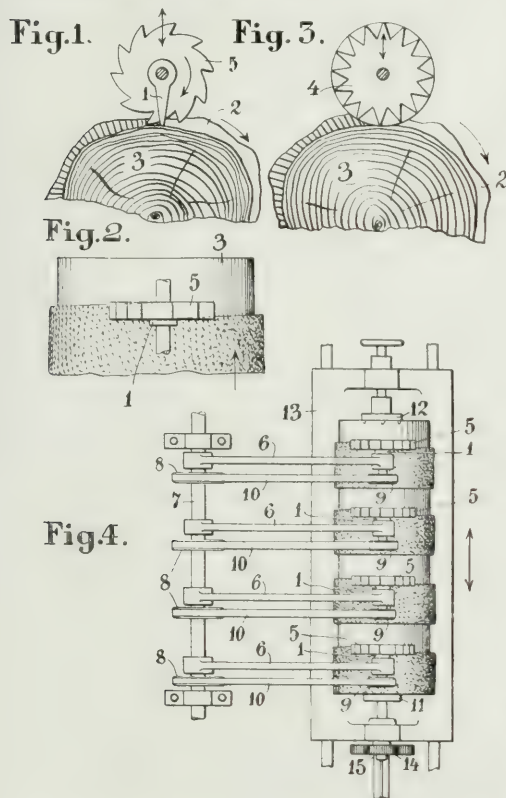
able of cutting the wood, out of contact with the latter.

In order that the invention may be clearly understood I will describe the preferred forms with reference to the accompanying drawings, wherein

Figure 1 is a diagrammatic sectional elevation of one form of cutting device. Fig. 2 is a plan view thereof. Fig. 3 is an elevation of a modified form of cutter. Fig. 4 is a plan view of a rossing or peeling machine embodying the invention. Fig. 5 is an elevation of another form of machine.

The cutter, as indicated by the arrows in Fig. 1, is movable up and down, and comprises a non-rotatable knife 1, which is only capable of penetrating the bark 2, so as to determine the depth of cut of the cutter 5, which is rotated in a direction opposite to that of the log 3, as indicated by the arrows.

A serrated disk 4, shown in Fig. 3 may be substituted for the knife, and as the teeth of the disk are incapable



of penetrating the hard wood, the rotating cutter cannot cut below the bark.

In the embodiment shown in Fig. 4 of the machine journalled in the free ends of arms 6 which are pivoted on a shaft 7, said cutters being pressed against the log 3 by their own weight and that of the arms 6 or by the action of springs, not shown. The shaft 7, is rotated by any suitable driving means, the rotation of the shaft being transmitted to the cutters 5 by pulleys 8 on the shaft 7 and pulleys 9 on the spindles connected by drive belts 10. The log 3 is fixed between chucks 11, 12, mounted on a movable slide 13 and rotated by means of a slidable gearing 14 driven from a shaft 15. The slide 13 is moved in the usual manner by a spindle, not shown, a screw motion being thus imparted to the log, which motion is so proportioned to the breadth of the cutters 5 that during one revolution, the log is fed a distance equal to the breadth of a cutter.

The object of the invention is to provide a peeling machine which will only remove the bark so that no wood is wasted.

The invention consists in providing a plurality of cutters comprising thin rotatable disks which are movable independently of each other and radially to the log so as to remove all the bark even when the latter is of different thickness on different parts of the log.

Each cutter is provided with a knife which is capable of cutting only through the bark which is softer than the wood, thus keeping the cutter, which is cap-

In the cross-section shown in Fig. 5 the logs 3 are secured by means of strips and the like on the circumference of a rotating wheel 16, and rotated by gears 17, 18. The shaft 17, crosses 6, cutters 5, knives 1, and driving rollers 7, 9, 10, the same as those previously described and shown in Fig. 4, are mounted on a shaft from 19 are connected through gearing 20, 21, mounted in vertical lines. The successive cutters 5 are spaced apart laterally the breadth of a cutter, the machine being so constructed that the log will be immediately picked up by the combined action of all the cutters.

The machine may in a known manner be provided with an automatic ejector 22 and an automatic device 23 for placing the logs in position in the machine.

WIRE CLOTH FOR USE ON PAPER-MAKING MACHINES.

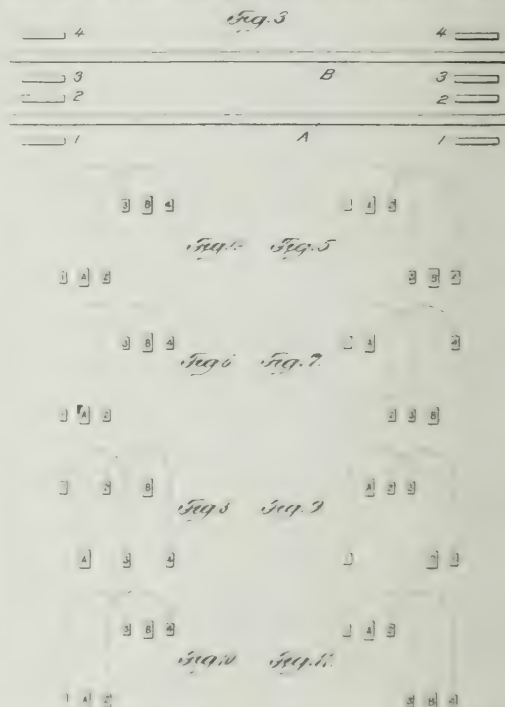
Charles A. Coups, Belleville, New Jersey, Patentee.

Patented July 21, 1914 in United States Patent Office.

The invention consists in a new wire-cloth for paper-making machines having the usual weave throughout its main body portion and at its opposite longitudinal side portions a twill weave of suitable width, say about one inch wide, the warp and weft wires throughout the cloth preferably being of the same diameter and character and the cloth thus formed being very durable and lasting and dispensing with the necessity of employing strengthening strips of cotton or silk threads and the like at the kind heretofore proposed for

The invention will be fully understood from the detailed description hereinafter presented, reference being had to two accompanying drawings, in which:

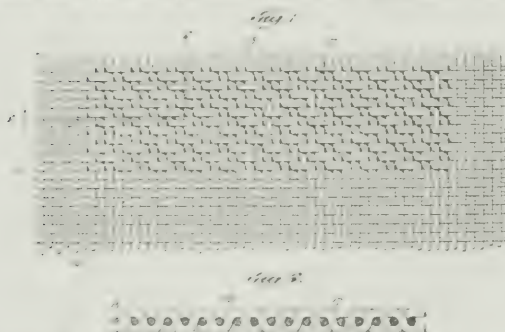
Figure 1 is an elevation, on an enlarged scale, of one longitudinal side portion of a length of wire-cloth embodying my invention, both longitudinal side portions of the length of cloth being identical in every respect. Fig. 2 is a section of the same on the dotted line 2-2 of Fig. 1. Fig. 3 is a diagrammatic top view of the usual two main heddles of a wire-cloth weaving loom and the eight supplemental heddles with which I com-



pare the loom, both of the supplemental heddles being adjacent to the left hand ends and four thereof adjacent to the right hand ends of the main heddles, and Figs. 4 the right hand side of Fig. 3 illustrating the various to 11 inclusive are diagrammatic end views taken from relative positions of the main and supplemental heddles during the weaving of the cloth. Figs. 4 and 5 indicating the positions during the plain weaving throughout the full width of the cloth at the starting of the weav- ing, Figs. 6, 7, 8 and 9 the positions at the starting and during the weaving which includes the twill strips or bands with the plain weaving, and Figs. 10 and 11 the positions during the final plain weaving finishing the cloth. Figs. 1 and 2 show the cloth of my inven- tion and Figs. 3 to 11 inclusive indicate the heddle positions for the production of the cloth.

The above cloth will vary in width as heretofore and be formed of the usual fine warp and weft wires 15, 16 customary in weaving wire-cloth for paper-making machines.

The cloth throughout the greater part of its body portion is of the usual plain weave, and the novel fea- ture of the cloth resides in the presence thereof, along each longitudinal edge, of a strip or band 17 of twill



strengthening the edges of Foulden or wire-cloth.

In producing the wire-cloth of my invention I employ a loom having the usual or main front and rear heddles, as shown in Fig. 3, and equip the loom with eight supplemental short heddles four being adjacent to each end of said main or main heddles and at equal width of the loom, the threads being between the end sections of said main heddles, one in front of the end section of the front heddle and one in rear of the end section of the rear heddle. The two main heddles perform the usual function as the production of the said weave, and the eight supplemental short heddles are utilized in the production of the strip or band of twill weave along each longitudinal side of the cloth in the plain weave.

In the practical construction of the wire-cloth the length thereof and the plain weave extending entirely across its width at each end be a limited extent, so as to enable the same to be suitably joined together by the continuous manner, while between said end portions of plain weaving the cloth throughout its length has at each side portion a suitable width of continuous strip or band of the twill weaving.

weaving merged into the plain weaving, this strip or band preferably being about one inch in width and extending nearly the full length of the cloth. The cloth at its opposite ends will have plain weaving for a limited extent across its entire width, as shown at the left and right hand ends of Fig. 1, to enable said ends to be properly joined together in the usual manner.

The plain weave in the cloth between the longitudinal planes of the inner edges of the strips or bands 17 is produced in the customary manner in a loom having the usual main heddles, A, B, diagrammatically represented in Figs. 3 to 11 inclusive, and the plain weave at the opposite ends of the length of cloth and in direct line with said strips or bands 17 is produced by the eight short heddles 1, 2, 3, 4, which during such plain weaving have the movements represented in Figs. 4 and 5. The warp wires are not threaded in those portions of the main heddles, which are in line with the heddles 1, 2, 3, 4.

The twill strip or band 17 is produced by the four parallel supplemental heddles 1, 2, 3, 4 adjacent to each end of the main heddles A, B, the supplemental heddles 1 being at the front and the supplemental heddles 2 at the rear end portions of the main heddle A, and the supplemental heddles 3 being at the front and the supplemental heddles 4 at the rear of the end portions of the main heddle B, as shown in Fig. 3; the heddles 2, 3, thus being close together and between the main heddles.

The weave of the band or strip 17 will be understood from Figs. 1 and 2, and will be recognized as a two-up and two-down twill weave, each warp wire 15 alternately being over two weft wires and under the next adjacent two weft wires and being so laid by the movements of the supplemental heddles through which said warp wires are threaded, as diagrammatically illustrated in the drawings.

The warp wires for the main body of the cloth are, between the inner ends of the short heddles, 1, 2, 3, 4, alternately threaded through the respective heddles A, B, as usual, and the warp wires for the opposite side portions of the cloth are threaded through the heddles 1, 2, 3, 4, which are employed at the starting of the weaving operations to, in conjunction with the heddles A, B, produce the plain weave, then to produce the twill strips or bands while the heddles A, B make the plain weave between said strips or bands, and finally to, in conjunction with the heddles A, B, complete the length of cloth with the plain weave extending throughout its entire width. In threading the warp wires through the heddles 1, 2, 3, 4, the first wire in each set of four wires will be threaded in heddle 1, the second in heddle 3, the third in heddle 2, and the fourth in heddle 4.

During the plain weaving at first end of the length of cloth the heddles 1, 2 and heddle A move together and the heddles 3, 4 and heddle B move together, said sets of heddles having alternate up and down movements, as indicated in Figs. 4 and 5. The twill weave will start with the heddles in the position shown in Fig. 6, with the heddle A and heddles 1, 2 down, and the heddle B and heddles 3, 4 up, and the next move of the heddles will be to the position shown in Fig. 7, with heddles 1, A, 4 up and heddles 2, 3, B down, the following movement of the heddles is represented in Fig. 8 showing heddles 1, 2, B up and heddles A, 3, 4 down; while Fig. 9 represents the final one of the cycle of movements of the heddles in making the twill weave and shows heddles 1, B, 4 down and heddles A, 2, 3 up. At the finish of that part of the weaving which includes the twill bands or strips, the heddles are all given the

requisite movements for the plain weaving shown in Figs. 10 and 11, which movements are repetitions of the movements indicated in Figs. 4 and 5.

It is believed that the method of producing the wire cloth will be fully understood from the foregoing description and the accompanying drawings without further explanation.

It is customary in weaving wire-cloth to provide in the loom a stiff wire at each side over which the filling or weft wires are folded, leaving loops 18, at the edge of the cloth, said wires forming no part of the cloth and the cloth stripping itself from said wires as it approaches and is wound upon the breast beam of the loom, and in the weaving of my cloth I make use of said wires for their usual purposes.

The wire-cloth of my invention is very durable and capable of withstanding long use. Various means have heretofore been resorted to for resisting the tendency of the wires, in wire-cloth of the class to which my invention pertains, breaking near the longitudinal sides of the cloth.

Ordinarily a few silk and cotton threads are woven, with the plain weave, into the edge portions of the cloth but these have not been efficient, although they are in almost universal use. My invention dispenses with the employment of the aforesaid silk and cotton threads and also of wires when they have been suggested for said threads. The twill weave bands constituting integral parts of my wire-cloth render the cloth as a whole of increased durability and value.

NORWAY AND DENMARK.

The Trade Commissioner of the Dominion Government in Norway and Denmark has the following to say regarding present conditions in those countries:—

Under the circumstances there is very little business doing in pulp, as no export can take place, so the market is a consequence entirely closed. There is no source of supply from foreign countries, and whether the mills can be kept running will depend on what profits the firms are able to realize towards furnishing money for wages. Further, it is feared, that the cellulose and paper mills must close down for want of coal, but this does not concern the mechanical mills, that are run by water power. During the next week the Wood pulp Association of Norway is going to have a meeting, when a resolution will be adopted as to the position the mills are going to take during the present crisis.

According to a report by the Norwegian Consul General at Copenhagen the report into Denmark of wood pulp during the first quarter of 1914 as compared with the same period in 1913, was as follows:

	1914.	1913.
Mechanical, dry	79,600	175,600
Mechanical, moist	7,494,000	7,158,000
Chemical, dry	300,400	321,300
Chemical, moist	4,687,500	2,619,300

The Iggesund Company, which with a capital of \$800,000 occupies on a complete hill and an iron foundry, has resolved to start a sulphite and sulphate mill with a smelter, production of 10 to 12 thousand tons English.

The shareholders in the Russian stock company "Dubrowka," which was started by Scandinavian business men, and from which meeting of the directors in Christiania a short time ago. It was resolved to enlarge the capital from 2 million roubles to 4 millions and to begin a new paper manufacture. Their paper production will come up to 18,000 tons (English) per year.

PULP AND PAPER NEWS

George Davidson, Toronto representative of the C. Howard Smith Paper Mills Co., Montreal, has opened offices at 124 Richmond Street West, Toronto.

The Algoma Timber and Lumber Co., a corporation under the laws of Michigan, empowered to purchase and sell timber and to manufacture it into its respective uses, has taken out a supplementary license to do business in Ontario, and has appointed Wm. E. Brown, of Sault Ste. Marie, as the representative of the company, which is authorized to spend one hundred thousand dollars in the province.

Joseph Kilgour of Kilgour Bros., Toronto, who is President of the Canada Paper Co., has again placed his fine property, Sunnybrook Farm, near Toronto, at the disposal of the Ontario Plowmen's Association for the holding of the Provincial plowing match which will take place on November 6. Valuable prizes will be offered in a large number of classes.

The Monarch Paper Co., Limited, has been granted a charter. The capital stock is forty thousand dollars and the headquarters are in Toronto. The company, the incorporators of which are Lewis F. Houtt, Alex. R. Currie, Fred J. Smith and Eugene Houtt all of Buffalo, and Ed. A. Crippen of Toronto, is empowered to manufacture, sell and deal in all kinds of paper and to carry on a general paper jobbing business.

Robert Davies, of Toronto, who is President of the Don Valley Paper Mills, and an enthusiastic horseman, recently secured some high class material at the Haggin yearly sales held at Sheepshead Bay, N.Y. In all five head were purchased for \$8,500, including the highest priced youngster of the sale, for which \$3,000 was paid. If breeding counts, the quintette should develop into high class racers for Mr. Davies' stable.

Carbon paper and typewriter ribbons, which have been imported largely from Germany and Austria, will now be made to a greater extent in Canada. Local dealers report that the stock on hand is fairly large. Canadian firms are getting a move on, and will endeavor to meet the demands of the market. This is an opportunity which they are taking advantage of, owing to the war, and it is expected that many others will develop in the paper line.

The new storage warehouse, which has been erected for the Howell Trading Co., on George Street, Toronto, is completed. It is of mill construction, 80 x 100 feet, and four stories high. One floor and a portion of the basement are bonded warehouses. The new building, together with the present quarters of the Howell Company, afford fifty-five thousand feet of floor space. There are six wide shipping doors, two three-ton freight elevators and all modern accessories. The company have already entered into several contracts for the storage of paper, felt and other kinds of goods, while a delivery service is also being conducted.

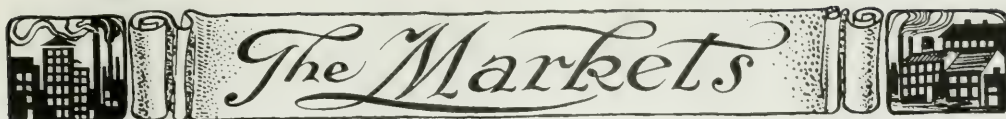
Numerous requests have been made to the Ontario Government Don manufacturers suggesting that, in view of the unsettled condition in industrial matters,

it would be advisable to delay putting in force the provisions of the Workman's Compensation Act, scheduled to come into force on January 1st next. The manufacturers say that they could not bear the extra burden of that the operation of the act would entail, and which would be of no benefit to those thrown out of employment. The matter has not yet been discussed by the cabinet, but is probable that a decision will be arrived at an early date. The general feeling is that the Act will not be put into operation until the industrial situation clears and settles somewhat.

At a representative meeting of every industry and class of business, which was held in the Toronto Board of Trade rooms and presided over by W. P. Gundy, Managing Director of W. J. Gage Co., and the Kinleith Paper Co., ways and means were discussed of fostering Canadian trade during the war. It was felt that the present was a very opportune time for Canadian manufacturers to extend their markets and make new lines heretofore imported into Canada, and that the stimulation of Canadian manufactures in this way would necessitate full staffs and relieve unemployment. A special committee was appointed to gather statistics and present suggestions.

Statistics show that for the year ending March 31, 1913, there was imported into Canada from Germany in paper and stationery \$571,850 and in chemicals \$833,300, and an effort is being made by certain Canadian firms to take advantage of these new openings. Owing to the impossibility of getting parchment, greaseproof, glassine, onion skin, and highly glazed kraft and other papers, a number of Canadian mills are considering the advisability of making these lines and are conducting investigations. The result of their decision will soon be arrived at. Some firms in Montreal, Toronto, and other cities, which have handled paper from Germany and Austria are disposing of their stocks and will close their doors owing to the inability of securing further supplies, at least for the present.

Toronto paper firms and publishing firms were not very generous in the matter of subscriptions to the Patriotic Fund, but have come forward with liberal offers in the stationery and printing for the Y.M.C.A. camp at Valcartier. The initial supply was fifty thousand letter heads and twenty five thousand envelopes, which disappeared at the rate of five thousand sheets a day. Last week the National Council of the Y. M. C. A. were the recipients of large gifts for correspondence paper, envelopes, etc. Buntin, Reid Co., heads, and Barber, Ellis, Limited, two hundred thousand envelopes, printed, while the Southern Press did the printing on the letterheads. Twenty five thousand hymn books, printed on rope paper with jute tag cover, are being presented to the soldiers in camp by the Y.M.C.A. The book consists of fifty-two pages. The paper for the hymn books was kindly supplied by the Don Valley Paper Mills and the Ratcliff Paper Co., Toronto, the Methodist Book and Publishing House set the type, W. J. Gage Co., did the press work and Brown Bros., the binding. The quantity of stationery will last the camp a month, and the action of the Toronto concerns is highly commended.



The Markets

CANADIAN MARKETS.

The pulp and paper industry is one of the most favorably influenced by the war, and while some lines may suffer, such as wrappings, building papers, and specials, the general condition of affairs is active. News print mills are rushed to one hundred per cent efficiency and inquiries still pour in from all quarters of the world. To the credit of all Canadian plants it must be said that they are taking every precaution to first protect and safeguard the interest of their customers, and what surplus they have, if any, they are disposing of to the best advantage. News print prices are very stiff and are now all arranged on individual basis rather than current quotations. The exporting mills have a great deal more business than they can attend to and some plants which have been making wrappings and specialties, are now directing their full energies on news print. Several Canadian papers have reduced the number of their pages. Ground wood mills are also busy, and practically all stored stock has been sold. Prices are stiffening and sixteen and seventeen dollars per ton is being freely obtained at the mills, while delivered the figure is from \$23 to \$25 and even more to distant points, where freight rates are not favorable. The demand for sulphite, both bleached and unbleached, is keen, and prices are largely a matter of arrangement from day to day.

Some fantastic stories have been circulated in the trade regarding the figure that certain mills have been offered and, while many insistent requests have been made for the delivery of large quantities, there is no doubt much exaggeration regarding prices, which have been withdrawn by the producers. Book and writing plants, as well as coated paper plants, have withdrawn their figures, but so far there has been no increase in prices, and the manufacturers say that it is too early as yet to make any predictions. It all depends on the figure that sulphite pulp and other supplies will reach. Columns have been written on the state of the markets, but, as a matter of fact, the war has not been waged long enough to radically alter the situation of affairs, but when the stocks on hand are used up and new contracts have to be made, there may be a totally different story to tell. The real facts regarding supply and demand will then come out, and what may be said at present is largely speculative. Strong kraft pulp has taken a big jump, and the discount on carload lots of paper to jobbers in Manilla, fibre and other lines have been withdrawn by some manufacturers.

That the outlook for business in the mercantile arena is not nearly as dark as has been painted, is evidenced by the fact that two big departmental stores in Toronto have again placed their orders for book and coated paper for fall catalogues with a large Canadian mill, and in one case the usual order was increased from ten to fifteen per cent. Book and writing mills are well employed so far and they take a hopeful view of the outlook. The war has had another effect, and that is a number of mills are looking into the possibility of making special lines of foreign papers to supply the Canadian trade. No decision has been ar-

rived at, but the advantages and cost are being carefully investigated, and some interesting announcements are expected soon. Imports of all foreign papers have been almost completely stopped and stocks are growing low. There have been increases in some lines of tissue and toilet papers to those not protected by contract. Many plants are cutting out colors as much as possible.

In the rag and paper stock market the prices on foreign trading stock has gone up from thirty to forty per cent, owing to war insurance, increased freight rates, higher exchange and the handicaps in shipping. Still Canadian handlers report that several good offers made to British firms have been accepted. Locally, prices have taken a strongly ascendant turn. Mixed papers are in great demand, and the country is being scoured for supplies. Domestic rags are scarce. One effect has been reported by dealers and that is, mills are less inclined to reject materials now, accepting them without protest.

Quotations f.o.b. Toronto are:

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in carload lots.
 News (sheet), \$2.05 to \$2.25 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 5c. to 7 1/2c.
 Sulphite bond, 6 1/2c. to 7 1/2c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$3.75.
 Manilla, B., \$2.90 to \$3.25.
 Manilla, No. 2, \$3.10 to \$3.50.
 Manilla, No. 1, \$3.35 to \$4.10.
 Unglazed Kraft, \$3.50 to \$4.50.
 Glazed Kraft, \$3.75 to \$5.00.

Pulp.

Ground wood (at mill), \$16 to \$17.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$48 to \$50, delivered in Canada.
 Sulphite (unbleached), \$50 up, delivered in United States.
 Sulphite (bleached) \$58 to \$59.
 Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings \$1.80 to \$1.90, f.o.b., Toronto.
 No. 1 soft white shavings, \$1.75.
 No. 1 mixed shavings, 50c.
 White blanks, 95c.
 Heavy ledger stock, \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 80c.
 No. 1 Manilla envelope cuttings, \$1.15.

No. 1 print Manillas, 60c.
 Folded news, 45c to 47½c.
 Over issues, 55c.
 No. 1 clean mixed paper, 35c to 37½c.
 Old white cotton, \$2.50 to \$2.75.
 Third sand blues, \$1.40 to \$1.50.
 No. 1 white shirt cuttings, \$6.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flamelettes, \$5.25.
 Ordinary satinets, 90c.
 Flock, \$1.00.
 Tailor Rags, 80c.

Prices in Montreal remain about the same, the only difference being in the substitution of spot quotations instead of contracts.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Beam News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5¼c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manilla, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$51 to \$59 per ton.
 Kraft pulp, \$4.60 to \$1.00.
 Ground wood No. 1, \$8.15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

All the best rangers which have been employed during the summer months by the Ontario Government and have been doing duty in the north country, have been released for the balance of the year. The heavy rains have put out all the forest fires, and made it unnecessary to retain the rangers any longer.

NEW YORK MARKETS.

New York, September 12, 1914.

The early excitement of the paper trade in the country has subsided to a large extent. Markets in all branches of the trade are now fairly well settled, and price quotations are stiff. Prices in all grades of paper have advanced.

Manufacturers have pursued in most cases a conservative course in withdrawing prices and accepting orders for not later than thirty days' delivery. The foreign pulp situation was the cause of most anxiety among paper manufacturers. Importers did not take any undue advantage of the situation and supplied all customers as far as possible with the light imports that came into domestic ports since the beginning of the war. Pulp prices advanced rapidly, but during the past two weeks maintained firm values. Importers have not stored pulp, although paper manufacturers here have been of the opinion that speculation has been the chief factor in the rising markets. Additional costs of importation were the causes of the higher prices. Stocks on this side have not been large, and what new pulp came over since the war, was subject to heavier freight charges, high insurance rates and payment for such lots was subject to a high rate of exchange. All these things added about 25 per cent to the c.i.f. cost of pulp.

The opinion prevails here that there is no real cause for fear of a pulp famine in this country, as domestic mills together with the surpluses of paper mills operating pulp plants could make enough sulphite to meet the demands of paper manufacturers. It is admitted that the higher costs of wood will add somewhat to the price of pulp. This price, it is believed, will not go far above the present quotation of 3.10c to 3.50c for bleached and 2.25c for unbleached sulphite, if at all.

There has been a considerable boom in rags and paper stock. A good deal of the rising prices was due to the trading amongst dealers, a number of whom preferred making sales to their own trade to seeking business from mills. Dealers engaged in this method are of the opinion that there will follow large rejections by mills and rather than stand the results of arbitration, rag dealers will accept a reasonable profit from other dealers. Packers are inclined to hold stock as closely as possible, and in some cases have held up deliveries hoping to sell the goods at a higher price than was to be paid for the original requests. The scarcity of linens has brought about a heavy demand for shirt cuttings, which are quoted about 6½c to 7c a pound. Old waste papers received active inquiry during the period of pulp shortage. Mills drew heavily on stored stocks of shavings which advanced in price to as high as 2½c to 2½c a pound. Old kraft papers have been in good demand at 1.35c. During the early part of this month paper men began to take a more optimistic view of the situation. Business took a turn for the better, and the market has reflected a healthier, though somewhat spasmodic, tone.

Pulp.

The situation in ground wood pulp has remained essentially unchanged. Grinders have been willing to take orders for pulp at prices somewhat lower than the fancy quotations that at first appeared. The prevailing market value is \$17.50 to \$18.25 a ton, f.o.b. ground wood mill. The news that 500 tons of ground wood pulp was en route from British Columbia

via Panama Canal to New York, was received with some satisfaction by a number of paper mills.

Imported bleached sulphite is scarce, and spot lots are in only small quantities on the dock. The values of this grade range from 3.25c to 3.50c a pound, ex-dock. Domestic bleached sulphite has been in fairly good demand at 3.10 to 3.35 f.o.b. sulphite mill. Unbleached sulphite pulp has been sold as high as 2.50 for imported grades. Prime qualities are not available. Domestic agents have sold unbleached sulphite at prices ranging from \$42 to \$45. f.o.b. sulphite mill. Soda pulp advanced from 1.80 to 2.25. Fairly frequent shipments of kraft have been made, but most of this was for shipment on outstanding contracts. Some spot lots are available at 2.20c to 2.35c.

The demand for old waste papers continued very good, and prices continued to go up. Hard shavings have sold from 2.65c to 2.80c a pound, and soft whites have advanced to 2.25c to 2.45c a pound. Mixed papers and old Manillas have been in good demand and prices have been quoted at 1.00c to 1.10c and 15c. Bleached sulphate, impt., 3.00 to 3.20, ex dock, to 47 1-2 respectively. Quotations are:

Ground Wood, No. 1, \$20 to \$24, delivered.
Ground Wood, No. 2, \$17.50 to \$20, delivered.
Unbleached Sulphite, dom., 2½c to 2½c f.o.b. mill.
Unbleached Sulphite, impt., 2.25 to 2.45, ex dock, New York.
Bleached Sulphite, domestic, 3.10 to 3.35.
Bleached Sulphite, impt., 3.00 to 3.55, ex dock, New York.
Easy Bleaching, impt., 2.75, ex dock, New York.
Unbleached sulphate, impt., 2.25 to 2.35, ex dock, New York.
Bleached sulphate, impt., 2.80c to 3.00c, ex dock, New York.
Kraft Pulp, 2.25 to 2.30 ex. dock, New York.

Paper.

Conditions in the local paper market have gradually changed it to a more normal state. The wild excitement that characterized the early period of the war when jobbers rushed to cover understocked ware-rooms, has gradually waned, until a fairly steady market with firm prices predominated. Newsprint has continued to move rapidly in contrast. Some manufacturers moved during the month of August considerably more of their product than they made, while running all machines full capacity. Others have notified their customers that it will be impossible for them to demand any more than their maximum pro rata consumption call for. Sheet news advanced to 2.35 f.o.b. New York. Transient orders for rolls have been rather scarce. Export inquiry continued fair and manufacturers moved good volumes to South America, Australia, South Africa, England and France at good prices. It was reported that the British market was bringing 2½c American ports, purchasers assuming all war risks. Wrapping papers were in rather quiet demand, although prices average about ½c a pound higher for all grades. Writing paper mills have withdrawn quotations and some have raised their prices. Book papers were in good demand. Some grades have advanced slightly, but the general market value has remained unchanged. Tissue papers have been in good demand. New York quotations are 47½c a ream for No. 1 white and No. 1 Manillas in car lots, and 50c in cars.

Paper bags advanced 1 per cent under a fairly good demand.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$2.05, f.o.b.
News, side, runs, 2.25.
News, sheets, 2.35 f.o.b. New York.
Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
Writing paper, superfine, 13½c to 17c. del. east of Miss. River.
Writing paper, extra fine, 11c del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c del. east of the Miss. River.
Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Linen paper, 7c to 18c, delivered east of Mississippi River.
Manila jute, 5½c to 5½c, delivered.
Manila, wood, 2.75 to 3.25, delivered.
Kraft, No. 1, \$3.85 to \$4.00 f.o.b. New York.
Kraft, No. 2, \$3.35 to \$3.75 f.o.b. New York.
Boxboards, news, \$30 per ton, delivered.
Boxboards, straw, \$28 per ton, delivered.
Wood pulp board, \$42.50 per ton, delivered.
Tissue, white, cylinder, 47½c to 50c f.o.b. New York.
Tissue, fourdrinier, 50c f.o.b. New York.
Tissue, jute Manila, 47½c to 50c. f.o.b. New York.

DISPUTE OF WAR LEADS TO TRAGEDY.

According to information from Millinocket, Maine, more than fifty lumbermen battled in the woods at Grand Brook recently after an argument over the European war. One man was killed and three were injured. Grand Brook is fourteen miles in the woods.

Two sheriffs who went to the scene with deputies are reported to be on their way here with 53 prisoners. The lumbermen are part of a crew of the Great Northern Paper Company. Most of them are Poles and French Canadians.

RAILWAYS CANCEL OLD OCEAN RATES.

It is learned in Ottawa that on September 10 the railways will cancel the through freight rate from Canada to the Old Country. The Railway Commission in dealing with the matter, found that the ocean rates are being increased owing to the heavy insurance charges due to the war, but the rail charges remain the same. The commission therefore cannot interfere. This will add to the cost of marketing the Western crop.

WILL CANCEL ALL GERMAN PATENTS.

It is understood that the Government will pass an Order-in-Council within a few days cancelling German and Austrian patents and trade marks in Canada. Hundreds of such patents have been taken out in Canada and they relate chiefly to chemical preparations, patent medicines, photographic and electrical supplies. The specifications for these patents will all be available here and new applications for the patents will be accepted from Canadians.

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No. 19

GENERAL OUTLOOK.

The Department of Labor in Ottawa has issued a lengthy summary of labor and industrial conditions throughout Canada which is exceedingly encouraging, and shows that there is a general revival of business following the depression when war first broke out; efforts, the report states, are being made all over the country to keep factories running and to maintain industry unimpaired.

It is pointed out that while a great number of establishments have closed down altogether, and others are operating on short time, the war has with some industries given business an impetus. Chief among these, according to the report, are flour milling, transportation, textiles, and last but not least, the pulp and paper industry. The Department says that the campaign which arose instantly after the war for the manufacture in Canada of articles which formerly had been imported from Germany, and the plans laid to capture some of Germany's export trade in commodities which could be manufactured in Canada were at the end of the month of August making headway, and a general feeling of confidence in Canada's ability to weather the industrial storm was being restored. Further, the tide of immigration which has been falling off since last December has since the outbreak of war become practically nothing. Hence with the depletion of the ranks of industry to fill the fighting forces and the readjusting to meet industrial conditions, the number of the unemployed is regarded as about normal.

This report of the Government's is most cheering at the present time. Our business may have to contract, and as a nation we may have to forego many of the comforts that we previously enjoyed, and must also leave off investments of a speculative nature, but we seem to be running with a fair degree of smoothness.

RESEARCH IN BEATING.

In the course of a few weeks, it is our hope that there may appear in the Pulp and Paper Magazine an account of the developments in the new Forest Products Laboratories, whose organization is now going ahead rapidly under Dr. J. S. Bates. While nothing can be done until the apparatus is in place, which should be some time in November, it is most important that members of the pulp and paper industry should grasp the significance of this new step and be prepared to welcome the work of Mr. O. F. Bryant, who has pulp and paper in hand, and to assist in every way possible with the development of the researches.

That the Dominion Government should have seen so early in the history of the industry the desirability of making extensive experiments which might serve as an impetus to manufacturing, is indeed a source of satisfaction to all who have the interests of the country and of science at heart. Our paper industry is just in its infancy, and the working out of problems to-day will serve to clear the way for the great march of progress that is sure to take place where natural resources, national ideals and the confidence of foreign investor and immigrant alike are apparent to so great an extent.

The Forest Products Laboratories have just received their new beaters.

To the lover of papermaking, particularly the man of scientific bent, be he technically educated or not, the very mention of experimental beaters is enough to give a lasting thrill of delight. New worlds lie open to the fortunate possessor. Without the demands of commercial production day in and day out hanging over his head, as they do over the heads of men engaged in the ordinary way of business, without the necessity of going into one line of investiga-

tion, but free to take up the work which appears to be of greatest service to all concerned the laboratory investigator has a glorious field before him. The one department of beating is enough to keep him studying from now until Doomsday. It is pleasant to reflect that on this question, which according to Clayton Beadle, occupies a pre-eminently important position in the process of papermaking, the Laboratory will soon be in a position to initiate its studies.

"The sheet," says Mr. Beadle, "may be said to be made or marred in the beater house, and no amount of care or skill on the part of the machine man will rectify carelessness or want of skill on the part of the beater man." This would lead one to ask if sooner or later by dint of experimentation scientists will not be able to penetrate the mists surrounding this operation, which now it seems possible to dissipate only by long practice.

The main difficulty in the way of the investigator who wishes to apply instruments of accurate measurement to beating is that the mechanics of beating, is, as Mr. Beadle says, complex and incapable of scientific treatment in so far as it does not lend itself to any form of numerical expression, and the mathematician or theorist must of necessity start with more or less rigid assumptions. Continental investigators have done much to advance the theoretical side of the operation of beating, but actual series of experiments speaking in the large, have been neglected. Even though German and other investigators have gone fairly deeply into the questions of power requirements and fibre lengths in the past few years, there are still great unexplored regions to venture into, whose boundaries only are known.

Since beating can produce almost any class of paper within the possibilities of the pulp being treated, every side of the question will bear the closest investigation. This is aside altogether from the immediate economic end, which concerns itself with the amount of power used per ton of paper produced.

But what, for instance, will extensive studies show as to that most confused question—the hydration of fibres under the different kinds of rolls? Again, what is the influence of chemical substances added to the pulp mass in the beater? What is exactly the result of long beating? What is the mechanics of shearing and brushing? Or, as the noted English authority quoted above further asks, what are the best procedures in regard to the mixing of pulp before beating or after beating, and what are the best uses of refiners and what thickness of pulp will give greatest efficiency to the beaters? These are but a few of the problems which await the scientists of the new Dominion Laboratories.

But to make their efforts fully available, there should be the most earnest co-operation on the part of manufacturers when the time comes. Practice, experience and long observation are essential to the success of any series of experiments. As this magazine

has already urged, in the course of the next year, beginning some time in the early winter, pulp and paper men can perform true service to themselves and the industry at large, by keeping close watch on their machines, and the results obtained, and by co-operating with the Laboratories. This science of beating for one, is still very little developed, and an infinite amount of work remains to be done. The investigation in Montreal and the experience of the mill men will do a vast amount to uplift our Canadian industry.

THE SULPHITE SITUATION.

Conditions in Norway and Sweden would seem to indicate that there will be a hard situation to face in the course of the winter. For several weeks now there has been a very great shortage of coal and two large mills there have closed down on this account. Also sulphur is lacking, it being practically impossible to import it. The water shortage of the past few months has added to the difficulties, and no matter how great the call from Britain or the United States and Canada, it is altogether probable that exports of Scandinavian pulp will fall off within six months. When the Baltic freezes up, as it will before long, it will be impossible to secure the supplies which have been coming waterborne to New York, and freight rates on the railways going across the mountains from Sweden to Norway will doubtless be raised on account of the diminution of food supplies within the two countries. We do not, of course, predict any famine in sulphite, and the attitude of the buyers in New York and other American centres at the present time would indicate that there is little fear of any tremendous curtailment, but at the same time it is probably true that the general tendency of prices of sulphite will be to rise noticeably. Prices are already fairly stiff, and stored stock is being sold at levels that would have done justice to first-class material a few months ago.

NOT ALL ROSES.

While the world looks on the paper industry and the newspaper industry in particular, as the most progressive and profitable in the present industrial crisis, it must not be thought that the paper mill which is rushed with orders now has all clear sailing, or that gold is raining in upon the manufacturers. It is true that the news mills in Canada are now rushed as they never have been before, and that in the tremendous demand for war news by the general public. The staffs of paper mills are going to the utmost of their resources to keep the supply of white paper adequate. But this demand does not indicate a clear profit. A great many of our mills have practically all their product contracted for at old rates, and there is very little new business coming in. They must simply keep up to the letter of their agreements with the newspapers, no matter what the expense, and this expense is

not by any means small. There is, for instance, the extra investment made necessary by the shortage of tin which is used in bearings. Dye stuffs are up, china clay is on the rise, alum is extraordinarily dear. There is the added trouble of the unusual strain on the machinery caused by the speeding up, and the loss in time through breakages in the paper. It has been frequently said that mills in Canada are in a position to receive an immense quantity of new business, but an analysis of the situation would show that this is hardly the case. In the past, Canadian mills have been taking advantage of the steady industrial conditions of the country to contract with newspapers for their requirements, and now that the increased demand comes, practically all the business is devoted to the concerns already booked. Nor is this condition likely to alter. Few manufacturers will see a clientele disappointed when contracts run out, and there is a demand for a greater amount of newsprint. Rather they will do everything in their power to safeguard customers and make sure that business goes along as favorably after the war as before.

EDITORIAL COMMENT.

One industry in Canada which is assured of prosperity in the near future is the manufacture of kraft. Scandinavian and German mills are being cut off, and the orders revert very largely to Canada. Twenty-seven mills in Germany are now out of business, and as a result the Wayagamack Paper Company is said to have received orders which run into four figures. There will undoubtedly be a great future to the kraft business in Canada.

TYPOGRAPHICAL ERRORS IN "THE DRYING OF PAPER."

Owing to an unfortunate oversight in the editorial and composing departments of this magazine, the excellent article of Mr. E. J. Trimbey on "The Drying of Paper" in the September 15th issue, was not properly proof-read, and several errors crept in. The instance with the proper readings are given below:

Page 535, Col. 1, 6th line from bottom—reads: "next strip was torn after passing the preceding top" should read: "next strip was torn out after passing the preceding top."

Page 536, Col. 2, 17th, 18th, and 19th lines from top reads: "per cent moisture. This is about the difference which through the calenders. This series of tests was also containing 25 per cent of ground wood."

Should read—"per cent moisture in the finished paper and one dried at 13 lbs. pressure with but 5.4 per cent of moisture. This is about the difference which might be expected between an all-sulphite paper, and one containing 25 per cent of ground wood."

Page 536, Col. 2, 7th line from bottom.

Reads—"tively, they continue equal on passing the 6th and 8th."

Should read—"in use and Curve No. 2 to the second group of tests."

Page 537, Col. 1, 4th, 5th, and 6th lines from top.

Reads—"are practically equal containing 28.2 per cent respec- weight of water per ream. The pounds of water per dryers at the ninth dryer, which was by-passed, No. 2."

Should read—"are practically equal containing 28.2 per cent and 28.3 per cent respectively, they continue equal on passing the 6th and 8th dryers, but at the ninth dryer, which was by-passed, No. 2"

Page 537, Col. 2, 10th line from bottom:

Reads—"No 1 at atmospheric pressure. These machines were."

Should read—"No. 1 at atmospheric pressure but is nearly equal to the rate of drying for No. 3 at 12 lbs. pressure. These machines were"

Page 537, Col. 2, 2nd and 3rd lines from bottom.

Reads—"will give at a glance the approximate pressure on a dryer header, which it is necessary to maintain to a."

Should read—"will give at a glance the approximate pressure on the dryer header which it is necessary to maintain to dry a specified weight sheet at a specified speed, if the paper is pressed to a."

Page 538, Col. 1, 15th line from top:

Reads:—"be 3 per cent —"

Should read—"be 30 per cent —"

Page 539, Col. 2, 19th line from bottom:

Reads—"Coal at —"

Should read—"coal at —"

Page 539, Col. 2, 14th line from bottom:

Reads—"——— this is a stronger argument"

Should read—"——— this is a strong argument."

BELGO COMPANY NOT DELAYED.

It appears that the Pulp and Paper Magazine was in error in certain statements made in the September 1st issue concerning the progress of the Belgo-Canadian Pulp and Paper Company and correction is gladly made.

Officials of the company state that the work on the sulphite digesters has not been stopped, as this magazine stated, but is keeping on nicely, and the company will be in a position to deliver sulphite in the early part of November. Following the completion of the sulphite plant, work will go ahead on the installation of the new paper machine, which will not be held up for a lengthy period as reported.

Mr. Biermans, the General Manager of the company, has now returned from Europe, and is actively engaged in the affairs of his concern.

IN FINLAND.

A correspondent reports that most pulp, paper and saw mills in Finland are shut down, all the largest having been closed for two weeks at time of writing (Aug. 28th) on account of lack of raw material and stoppage of sea export, no boats leaving the country. Good order, however, prevails.

EFFECTS OF VARYING CERTAIN COOKING CONDITIONS IN PRODUCING SODA PULP FROM ASPEN^{*1}

By HENRY E. SURFACE

Engineer in Forest Products, Forest Products Laboratory, U. S. Department of Agriculture.

AS noted in the last issue of Pulp and Paper Magazine experiments of soda pulp have been in progress in the United States Forest Products Laboratories. The bulletin of Mr. Surface on the subject will be published in these columns in two installments).

Reference Notes on page 568).

At the present time practically all of the soft, easy-bleaching pulps used for the manufacture of high-class book, magazine, general printing and the cheaper writing papers are made by the soda process. In England such pulps are produced from esparto (alfa, or Spanish grass); in America, from the poplars and similar woods. Although the soda process of wood-pulp manufacture is not employed commercially to so great an extent in America as the sulphite and mechanical processes, it is remarkably well adapted for producing pulp fibres from any kind of wood or other fibrous vegetable material, no matter how resistant to chemical attack it may be. For this reason it is much used in the experimental work of the Forest Service.

To insure that a wood has been subjected to the most favorable cooking conditions it is necessary to cook it under many different conditions produced by varying such factors as the amount and concentration of the cooking chemical and the duration and temperature of cooking. While the general effect of using greater or less severity of cooking is well recognized in mill practice, there has been almost no available information on the quantitative effects of the individual factors concerned nor on the limitations within which such effects are exerted. Such meager information as may be found in the literature is widely scattered and is not strictly applicable to manufacturing conditions. Notwithstanding modern improvements and the general tendency toward more efficient operations in commercial plants, the most economical production apparently is not being attained by all of the soda-pulp mills. This is indicated by the fact that some of them are using from 10 to 20 per cent more pulp wood, from 50 to 100 per cent more chemicals, and from 10 to 40 per cent more steam, and require much larger plants and more labor for the same tonnage output per day than others making similar products. It was to secure and make available detailed information which would both facilitate other experimental work in the laboratory and promote the efficiency of commercial plants employing the soda process that the series of tests discussed in this bulletin was undertaken. They were carried out at the Forest Products Laboratory maintained by the Forest Service at Madison, Wis., in co-operation with the University of Wisconsin.

The report of the experimental work is prepared in a most descriptive of the soda process and a review of previous investigations. Some general conclusions as to the material for soda pulp and on the pulp itself will be treated in a later issue. This

species of poplar was selected as the test material because it is the most important soda pulpwood. The information secured however, is of much value also in connection with the cooking of other woods.

The Soda Process and Its Application.

What is here referred to as the soda process may be considered as a modification of the old Watt and Burgess process, first practiced in 1853,² and probably the oldest commercial method for producing chemical pulp from wood. It originally consisted in digesting suitably prepared wood in a large boiler with a strong solution of caustic soda under a pressure of about 90 pounds per square inch for 10 or 12 hours. The wood was then washed to remove the alkali and treated with chlorine gas or an oxygenous compound of chlorine. The partially digested wood was then washed to free it from the hydrochloric acid formed and again treated with a small quantity of caustic soda solution. The pulp so produced was then washed, bleached and beaten in a beating engine, after which it was ready for the paper machine. The modification of this process as employed at the present time in the United States dispenses with the intermediate digestion treatment with chlorine compounds. Different cooking conditions are also used, the details of which, together with a brief description of the manner of preparing the wood are given below.

While a few mills cook their wood unbarked or only partly barked, the general practice is to remove even the live inner bark. The barked or peeled wood is then cut diagonally with the grain into slices or chips about one-half to three-fourths inch thick by means of a machine called a "chipper." These pieces are then further broken up by means of a disintegrator, or "shredder," and the resulting chips are conveyed to storage bins, usually above the digesters. An intermediate screening operation to remove dust and dirt and to secure uniform chips is sometimes given them.

On account of the strong solvent power of the cooking liquor used in the soda process it is not necessary to remove completely the knots or decayed portions of the wood. At some mills, however, the chips before being stored are sorted into different grades from which different qualities of pulp are produced. In the case of peeled wood, delivered as such to the mill, the outer shavings, if the wood is reclaimed, are kept by themselves and converted into a lower grade product. In some of the older mills the knots were removed from the peeled logs with a boring machine, and later the chips were picked over by hand. Such procedures, however, have now been practically abandoned in America.

The digestion used in soda-pulp making are either rotary or stationary, and may be either cylindrical or spherical in shape. The present tendency in new installations is towards stationary, vertical, cylindrical

cal digesters heated by live steam which enters at the bottom of the digester in such a manner as to carry the cooking liquor through a pipe to the top of the vessel and spray it over the chips. This insures good circulation. The chips and cooking liquors are charged through a manhole at the top of the digester, the bottom of which is provided with a "blow off" pipe and valve for discharging the pulp after the cooking is complete. Such digesters are from 15 to 50 feet high by from 4 to 9 feet in diameter. The larger sizes have been lately introduced; in the past the most common size held about one cord of wood and was 16 feet high by 5 feet in diameter. At the time of the 1905 census the average American digester produced about 1 ton of pulp per cook, and the total combined capacity of the 208 soda digesters in operation then was 222 tons of pulp per cook.

As soon as the charging of chips and caustic soda cooking liquor is complete, steam is turned into the digester until a certain cooking pressure or temperature is reached. This temperature varies at different mills, but one corresponding to 110 pounds steam pressure per sq. in. is probably the most common at present. The pressure is continued from three to eight hours or more.⁴

Washing of Pulps and Recovery of Cooking Chemicals.

After the digestion process is completed the pulp in the digester is generally forced out under pressure or "blown" through a pipe connected with the bottom of the digester into a "blowpit" or "balloon"; whence it is transferred to large washing pans. Here it is drained as free as possible from the strong spent cooking liquors, called "black liquors," and washed thoroughly, first with hot, weak, black liquors from the last washings of previous cooks, and lastly with fresh hot water. The first drainings and washings which contain the greater part of the alkali cooking chemicals are run to evaporators, concentrated, and later calcined in furnaces. The burned ash, called "black ash," is leached in water, and the alkali in the form of sodium carbonate is dissolved. The resulting solution is treated with quicklime (CaO), which changes the carbonate into caustic soda. Modern practice recovers from 88 to 92 per cent of the alkali charged into the digesters. By properly controlling the strength of the black ash solution and mixing various strengths of recausticized solutions, a caustic soda liquor of the desired strength for cooking is prepared.⁵

Treatments Given the Soda Pulp.

After the pulp has been thoroughly washed it is diluted with a large amount of water and screened to remove uncooked portions. This is accomplished by either flat plate, disc, or drum screens, or by such screens in conjunction with centrifugal ones. In the case of aspen or poplar the greater proportion of the water in the pulp is then removed by means of "squeezers," "rollless wet machines," or "deckers." The pulp is then treated in a suitable vessel with bleaching powder solution, and afterwards thoroughly washed. Very little aspen or poplar pulp is left in the unbleached state, but is usually bleached immediately after it is screened. Those mills making both pulp and paper generally carry the bleached wet pulp directly through the subsequent paper-making operation; but if the pulp is to be sold or stored it is simply run over a paper machine into rolls of dry pulp (about 10 per cent water).

Previous Investigations.

The treatises by Cross and Bevan⁶ and by Schwalbe⁷ and the recent experiments⁸ by Viewig, Miller-Moskan, Miller, Schwalbe, and Schwalbe and Robinoff give much information on the nature of the chemical reactions which take place between caustic soda and cellulose under various conditions, and on the formation of decomposition, mercerization, and other similar products from cellulose.

While the manufacturer of paper pulp is interested in these chemical investigations they do not give him much practical information on the inter-relation of the various cooking conditions which he employs and the effect of their modifications on the yield and quality of the pulp.

An article published by Tauss⁹ in 1889, dealing with the effects of water alone on cellulose-containing materials, is of interest in connection with the Forest Service tests because the "yield" or residue with zero caustic soda assists in determining the curve for the effect of amount of caustic soda on the yield of crude pulp. Fig. 4. Tauss's experiments showed (Table 1) that a very appreciable amount of solids can be extracted from wood and from cellulose by boiling in water, especially at high pressures. In 1890 the same author published the results of investigations in which caustic-soda solutions were employed in the place of water alone. The experiments with caustic soda were made partly with solutions of a concentration employed in commercial practice, partly with more concentrated, and partly with more dilute solutions. The calculated residues (Table 1) afford some interesting comparisons with the Forest Service yield data.

In 1907 De Cew¹⁰ published a technical article dealing with the function of the soda process in the production of wood cellulose. Although no data are cited to substantiate his conclusions, he makes the following statements:

The results obtained with this process depend very largely upon the accuracy with which it is carried out. The action of caustic soda is one of hydrolysis, in which the woody molecule is gradually broken down with the formation of acid products which combine with and neutralize the alkali, leaving the cellulose in the form of isolated fibres. Now, if sufficient alkali were used and the cooking action continued, the entire fibre would finally be dissolved, although the more resistant celluloses would be the last to disappear. It is, therefore, necessary in order to bring into solution only the fibrous portion of the wood to add just sufficient alkali for this purpose.

This is almost entirely neutralized by the acid products formed from the lignocellulose, and thus very little free alkali is left in the liquor to attack the rest of the fibre, which should be almost pure cellulose. At first the alkali is very active and a rapid combination takes place, but the rate of reaction becomes continually slower as the free alkali grows less and the residue increases. There are also such varying conditions as consistency, pressure, circulation, and time of cooking, which are of considerable importance in the process, for some woods are obtaining from 1-200 lbs. of fibre per cord more than others in treating the same kind of wood.

In regard to the time required for cooking there is a wide difference in practice. However, the most important points are not able to effect the complete dissolution of the wood in a very short time. In fact any of the commercial woods can now be reduced in about four hours. With the improvements in the methods of cooking that have been developed, which en-

TABLE 1.—Effects of boiling with caustic-soda solutions of various strengths and with pure water. (Calculations from Tauss's data.)¹

Material	Air-dry weight of material treated.	Caustic soda (NaOH) used for each boiling.					Pressure, pounds per square inch.											
		Strength of solution.		Volume of solution.		Weight per 100 grams of material treated.	0 (1 atmosphere).					55.5 (5 atmospheres).			132.3 (10 atmospheres).			279.3 (30 atms.).
							1	2	3	4	5	1	2	3	1	2	3	1
		Grams.	Sp. gr.	Grams per liter.	Cc.	Grams.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
Pure cellulose (Swedish filter paper)	10	1.162		140	500	700	78.12					22.67						
	10	1.090		80	500	400	83.01	78.14	77.21			55.48	46.24	41.98	49.71	43.20	41.02	
	10	1.043		30	500	150	87.93					84.64			79.72			
	10	1.000		0	1,000	0	100.00					99.26	98.86	98.61	90.56	86.72	86.52	
	20			0													(1)	
Beech wood (fine shavings)	10	1.162		140	500	700	53.57					8.52						
	10	1.090		80	500	400	58.23	48.10	45.32			35.64	32.77	30.20	29.34	24.62	20.61	
	10	1.043		30	500	150	69.75					44.34			34.41			
	10	1.000		0	1,000	0	96.20	94.00	92.75			78.40	74.40	73.15	68.32	62.20	61.59	
	20			0													(2)	
Pine wood (fine shavings)	10	1.162		140	500	700	64.55					2.87						
	10	1.090		80	500	400	68.11	59.26	54.80	51.57	48.63	43.09	32.53	24.15	25.68	21.11	18.20	
	10	1.043		30	500	150	71.63					49.04			29.69			
	10	1.000		0	1,000	0	93.82					84.60	81.53	80.82	88.22	85.10	83.90	
	20			0														

¹ Tauss states his results as parts of extracted matter per 100 parts of air-dry material. The percentages shown in this table were calculated by subtracting Tauss's values from 100. Hence the residues as calculated are subject to errors due to lack of a common moisture basis for the extracts and original material, and to losses of volatile matter. The calculated residues, although not strictly accurate, are comparable with each other.

² The solutions containing zero grams per liter of caustic soda consist of pure water only.

³ A jelly-like hydrocellulose was obtained.

⁴ No explanation has been given as to why extractions at 10 atmospheres pressure should leave greater residues than extractions at 5 atmospheres pressure.

⁵ No hydrocellulose was observed.

Note.—The numerals at the top of columns signify the serial number of the successive boilings given the same sample of material. In each case the material was boiled for three hours with fresh solution or water.

able us to get about twice the work out of a digester that was formerly obtained, a number of special advantages have been found to be the result of these quick cooks. The shorter the time the alkali is in contact with the cellulose, the higher is the yield obtained and the sounder and stronger is the fibre. If all of the cellulose is freed from the lignin at practically the same time, the free alkali will have very little time to react on the weaker celluloses and the fibres will not be broken nor the points and serrations dissolved. Moreover, the fibres from the short cook are not hard to bleach, because the character of the cellulose is uniform. Under conditions of complete saturation with the right proportion of alkali, the lignocelluloses can be almost instantly dissolved by subjecting the materials to the temperature and pressure that is ordinarily used for cooking the fibre. The writer has performed this experiment on a laboratory scale, and the fibre obtained so closely resembled the actual structure of the woody cell that hardly any cellulose could have been dissolved.

Clapperton,¹² in 1907, in writing about the soda process, says:

It is the necessity for employing such high temperatures and pressures (90 pounds per square inch) that constitutes the serious drawback to the alkali process, viz. under the conditions of boiling the strong caustic soda acts on the cellulose, impairing the strength and reducing the yield. The reason why such conditions are necessary is that the soluble acid bodies evolved by the caustic become so oxidized and condensed that they counteract and weaken the reducing action of the soda and in order to equalize their resistance higher temperatures and pressures have to be employed.

Beckwith¹³ recently published the results of some of his experiments on the effects of varying the cooking

conditions in the production of esparto pulp. He says:

The treatment of esparto by the soda method is typical of the preparation of paper pulp from nearly all fibre-yielding plants, such as bamboo, straw, wood, etc. The isolation of cellulose is brought about by digesting the prepared plant in an alkaline solution, having for its base caustic soda, at variable temperatures and under variable lengths of time. The chemical reaction which takes place during this digesting process is not known; that is to say, has not been isolated because of the complicated character of the encrusting substances surrounding the fibre in the plant. The caustic soda in aqueous solution forms soluble compounds with these encrusting bodies and dissolves any silica which forms a part of the plant's structure, so that by subsequent draining, washing and bleaching the liberated cellulose is obtained in a comparatively pure state. Cellulose from whatever source it is obtained is, however, soluble in aqueous solutions of caustic soda. Moreover, the solvent action of the caustic

TABLE 2.—Experiments regarding yield of air-dry bleached pulp from Oran esparto.

No. of experiments	Soda liquor			Conditions of boiling			Weight of air-dry pulp	Dry pulp as dry esparto	Bleaching powder.
	Volume	NaOH		Time	Temperature	Pressure			
	Grams	Cc.	Per cent.	Hours	°C.	Lbs.	Grams	Per cent.	Per cent.
1	200	800	1.78	3	142	35	97.31	48.61	28.3
2	200	800	2.13	3	142	35	91.81	45.90	18.5
3	200	800	2.69	3	142	35	72.00	36.00	10.5

Note.—The different trials were made in 16-ounce iron tubes fitted with narrow cups, 3/4 inch being heated together in an oil bath for three hours at a temperature of 50° deg. F. (55 pounds above atmosphere).

tie is accelerated by heat and by the length of time (within limits) in which the two bodies are heated together. It is therefore apparent that if the maximum yield of cellulose is desired when using this method due regard must be paid to the laws regulating the yield. These laws may be expressed thus: The yield of cellulose obtained from any plant by the caustic soda method depends upon:

- (1) The proportion of caustic soda (NaOH) used per unit weight of plant;
- (2) The temperature employed; and
- (3) The length of time the digesting operation is continued.

If any one of these conditions be altered and the other two kept constant, the yield varies inversely as the altered condition. Thus, in the case of esparto, the author performed a series of experiments in which the proportion of caustic to unit weight of esparto was varied, whilst the temperature and duration of time of digesting were both kept constant with the following results (Table 2).

The following is taken direct from Cross, Bevan, and Sindall's¹⁰ resume of Beveridge's experimental results, which include the data quoted in Table 2 and others:

He made three sets of trials, as follows:

Constant conditions.

1. Time and strength of caustic.
2. Pressure and time.
3. Pressure and strength of caustic.

Variable.

Pressure varied.
Strength of caustic varied.
Time varied.

The results were:

1. Increase of pressure resulted in a diminution of yield, the quantity of pulp obtained being reduced considerably.

2. Excess of caustic soda caused rapid diminution in the yield of cellulose.

3. Gradual exhaustion of the caustic soda by prolonged digestion prevented such serious diminution of yield.

The discussion and experimental results which have been quoted show in a general way the effects of varying some of the fundamental cooking conditions in the soda process. None of the experiments cited are directly comparable to commercial practice in this country, because the testing conditions were not sufficiently representative of manufacturing conditions, and, in the case of Beveridge's experiments, because esparto—a grass, or pectocellulose was used as the test material. Moreover, the effects of the cooking conditions employed were not studied in as great detail as seemed desirable. The experiments show very clearly, however, that improper cooking conditions are wasteful or inefficient, and indicate the need for complete experimental data on which improvements in commercial practice may be based.

Method of Conducting Experiments.

Scope and Plan of Tests.

Aside from the character of a wood or other material prepared for cooking, the principle cooking conditions affecting yield and properties of pulps, consumption of cooking chemicals, and the general efficiency and costs of the cooking operations are indicated under the following general headings:

- (1) Preliminary treatments which may in some cases be given the prepared chips. This includes such

treatments as preliminary pressure, vacuum or steaming.

- (2) Character of the cooking apparatus, including size, shape and construction of the digester; manner of heating, whether by saturated or superheated steam turned directly into the digester, or by the use of steam jackets or flue gases; also the degree and kind of mechanical agitation employed, if any.
- (3) Proportions of the charges. This covers the amounts of wood and chemicals; also the amounts of water present in the wood and the original cooking solutions, together with the water condensing in the charges from steam used in cooking.
- (4) Character of the cooking liquors when charged. Such items as causticity, initial temperature, impurities and concentration are important.

TABLE 3.—Plan of cooking experiments.

Test group	Number of tests	Cooking conditions under investigation.			
		Initial concentration of caustic soda in digester liquor.	Amount of caustic soda per 100 pounds of wood.	Maximum cooking temperature, equivalent steam pressure.	Duration of cooking at maximum pressure or temperature.
I.	6	Constant—80 grams per liter.	Variable—from 15 to 60 pounds in steps of 5 pounds each.	Constant—100 pounds per square inch.	Constant—6 hours.
II.	6	Same as Group I.	Constant—25 pounds value, derived from Group I tests as most satisfactory for further tests.	Same as Group I.	Variable—from 1 to 11 hours in steps of 2 hours each.
III.	6	do	Same as Group II.	Variable—from 75 to 100 pounds per square inch in steps of 5 pounds each.	Constant—7 hours value, derived from Group II tests as most satisfactory for further tests.
IV.	4	Variable—from 100 to 150 grams per liter in steps of 20 grams each.	do	Constant—100 pounds per square inch value, selected from Group III tests as most satisfactory for further tests.	Same as Group III.

In commercial practice it is customary to vary the amount of caustic used and its initial concentration both at the same time when attempting to change the severity of the cooking due to these factors. This results in the volume of the cooking liquors being kept approximately the same, which is a desirable feature. In these tests, however, it was the intention to find out the effects of each factor separately.

5. Duration of the cooking treatment. The treatment is in three periods—a, a period of increasing temperature, b, a period at maximum temperature, and c, in some cases, a period of decreasing temperature.
6. Pressures and temperatures. This considers the pressures and temperatures of the digester contents at different stages of cooking; also the temperature of the digester room (as affecting radiation and condensation).
7. Manner of admitting steam, "relieving," and "blowing" the digester.

Since the effects of the variable cooking conditions may be modified by the treatments given the pulps after leaving the digester—such as leaching or washing screening and bleaching—these treatments must also be taken into account, for it is not possible to determine all the important effects of the cooking treatments until the finished pulps have been prepared.

The many factors are more or less interdependent, and any change in one results in unavoidable changes in others. Four of the more fundamental of these factors have been investigated in the Forest Service experiments. They are:

- 1) Amount of caustic soda charged per pound of wood.
2. Duration of cooking at maximum temperature.
3. Maximum temperature pressure of cooking.

4 Initial concentration of the cooking chemicals.

The effect of these four factors upon the yield and properties of the pulp and consumption of cooking chemicals were determined.¹⁷ The tests fall naturally into four groups, in each group all the conditions were held as nearly constant as possible except the factor under investigation, which was varied in successive tests or "cooks" according to a definite plan. The plan of the tests is shown in Table 3. In addition to the factors mentioned in this table all other factors under control were so far as possible held constant. Those for which values were specified are the following:

Amount of chips for each charge, 40 pounds bone-dry weight.

Dryness of chips, air dry.

Causticity of cooking liquor, 95-98 per cent.

Temperature of charging cooking liquor, 22° C. 72° F.

Temperature of digester room, 22 deg. C. (72 deg. F.)

Duration of cooking before maximum pressure is reached, 1 hour.

Duration of cooling and relieving digester before blowing, 5-10 minutes.

Blowing pressure, 30 pounds per square inch.

Reference Notes.

¹ This paper presents detailed information of value in experimental work in the laboratory and in promoting the efficiency of commercial paper-making plants employing the soda process.

² Charles Watt and Hugh Burgess secured a United States patent on this process in 1854. It was developed further and modified by Nathan in France (1855), by Houghton in England (1857), and by Albert Ungerer, to whom a British patent was issued (1862). Further modifications gradually resulted from its commercial application.

³ The barking loss amounts to about one-fifth of the weight of untreated logs. The losses in the case of logs from 31 trees used in these experiments varied from 16 to 29 per cent, which checks quite well with Ziegelmeyer's figure of 19.5 per cent on Eastern spruce. (See Stevens, Paper Mill Chemist, p. 159, 1908.) Aside from the convenience and ease of barking in the woods the saving of freight is considerable when the wood is transported to the mills by railroad, and since the barked wood dries and rapidly an additional advantage is secured by the loss of weight in seasoning. A cord of green aspen (about 50 per cent water) weighs about 1,900 pounds more than the same wood air dry (about 15 per cent water).

⁴ The detailed cooking conditions employed at various mills will be treated in another issue.

⁵ A few mills still adhere to the older practice of not recovering soda ash from the black liquors. Such mills buy the alkali for use in the form of caustic soda (NaOH). The cooking liquor is produced by dissolving in water a sufficient quantity of the caustic to give a solution of the desired strength. The black liquors are not so waste and although the consumption of cooking chemicals is very high, the mills seem to operate at a profit.

⁶ Cf. Jones, *U. S. G. A. Researches on Cellulose*, 1895-1900, 1900-1905, 1905-1910.

⁷ The *Chemical Abstracts*, 1910-1912.
⁸ For the *Chemical Abstracts* references see bibliography in appendix.

⁹ *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.
¹⁰ *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.

¹¹ *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.

¹² *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.

¹³ *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.

¹⁴ *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.

¹⁵ *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.

¹⁶ *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.

¹⁷ *Ind. Eng. Chem. Anal. Ed.*, 1, pp. 216-228, vol. 17, 1889. *Ind. Soc. Chem. Ind.*, p. 216, vol. 1, 1890.

Ottawa Notes

Ottawa, Ont., September 25. — As a result of an investigation in the city of Hull last week by an inspector of the Quebec Government, the wholesale theft of valuable saw logs and pulpwood belonging to lumber and paper firms on the Ottawa river has been discovered. It is alleged that the stolen logs have been located, cut and piled in cordwood, in the backyards of certain inhabitants of Hull, and it is understood that prosecution will be entered against them.

The logs, which comprise some from the E. B. Eddy, J. R. Booth and Gilmour companies, have been identified by the company marks stamped on the ends of the logs. From the fact that some of the Gilmour firm's logs were found, the authorities think that the thefts have been going on for some length of time and on an organized basis as the parties who took them must have towed them up the river from the Gilmour mills to the places where they were found.

* * *

It is now understood that the reason the Fraser Lumber Company of Deschenes, Que., has deferred the transfer of its big mills at Deschenes to the Hurrieanaw district where it owns large limits of saw timber and pulpwood, is the fact that the North Railway Company, which originally intended to construct a line which would have supplied facilities for getting out the lumber from that district, have now dropped the project. It will probably be a long time before any railway will be built in this direction for though the Government announced that it would construct a line to connect Montreal with the National Transcontinental, the war will probably greatly defer the starting of work on this scheme.

* * *

The closing down a month ago of the greater part of activities of the J. R. Booth lumber and paper company has already caused considerable destitution among the families of employees, who form a large part of the citizenship of the city of Hull. As a result a deputation from the Hull city council waited on Mr. Booth a week ago and requested that the mills be operated at full capacity once more if at all possible. They were informed by Mr. Booth that as the company was losing money by its forced inaction every effort would naturally be made to have all the mills running again. However, the water in the Ottawa river is now lower than ever and still dropping. The effect of the breaking of the big Government conservation dam at Lake Temiscaming some months ago is now being keenly felt.

At the Booth plant the paper mills are being reported day and night by steam and the pulp mills are running on partial time but the sawmills are idle.

* * *

The Trade and Commerce Department is making every effort to encourage Canadian paper manufacturers to capture the export trade which Germany loses as a result of the war situation. In a recent bulletin issued to manufacturers the opportunities presented by South American markets were emphasized. The Argentine Republic in 1912 imported \$9,500,000 worth of paper of which about \$2,400,000 came from Germany as compared with but \$600 from Canada. Argentine obtains practically all its printing paper, about \$900,000 worth, from Germany; paper board, \$500,000; writing paper, \$200,000; news print, \$600,000 etc. Germany also exported woodpulp of a

To be continued

value of \$100,000 to Argentine. Brazil imports paper to the amount of \$2,500,000 annually from Germany.

It is recognized however that an even readier market is that of Great Britain. The Trade and Commerce Department announces that many inquiries have already been received from England for Canadian pulp and paper and already a number of English paper

dealers have arrived in the Dominion to place orders. It is understood that Canadian writing papers of the lighter class are particularly desired and that Canadian office papers will also be in considerable demand. The market for news print of course, will always be first while the war lasts with its demand for newspaper extras.

A COMBINATION WATER SOFTENER AND STORAGE TANK

With the water problem ranking among the very highest in importance in those of the manufacturer, the development of new methods of preparing water for use in boilers is of the greatest import. L. M. Booth, writing in the *Journal of Industrial and Engineering Chemistry*, sets forth some points which mean much to the paper maker.

Any water purification process implies, says Mr. Booth, that the purified water is to be used. How best to store this water between the time it is purified and used is a matter for consideration. In some industrial plants, the rate of use of water is fairly constant throughout the day, the water is used as fast as it is softened and no storage is necessary. Most water users, however, have one or more considerable peaks in their load requiring the delivery of large volumes of purified water during a short space of time. The usual plan has been to provide a separate tank or reservoir.

During the past ten years a great many softeners equipped with excelsior filters, affording storage capacity for one hour's flow—more or less—sufficient for ordinary requirements of an industrial or power plant—have been built. Usually, this storage capacity is provided by increasing the height of the tanks a few feet above the filter to gain the desired volume. A softener arranged to include storage capacity above the filter is shown in Fig. 1.

This provision for storage capacity, while adequate to serve the needs of most power plants, necessitates the use of raw water for, perhaps, half a day, twice each year, in order to provide opportunity to change the filtering material. To use raw water, pumped directly to the feed water heater for boiler feed, for such a brief interval, is not especially objectionable. For railway water stations, however, such a plan has very little to commend it, because during periods of filter cleaning, there would be no water available, stored at sufficient height, to fill a locomotive tender in the usual short period.

The best water softening practice in vogue at the time the first modern water softeners were imported from Europe, late in the nineteenth century, called for the use of filters to clarify the imperfectly settled water. Usually, these filters were constructed of "excelsior" (wood shavings). Careful observations of softeners operated at a small fraction of the rated capacity—corresponding to more liberal design—readily demonstrated that if the rate of upflow in the settling space were restricted to a very slow flow, practically no suspended matter reached the filter. By gradually adopting more liberal standards of settling tank design, the point is soon reached when the expense of installing and maintaining a filter for purifying boiler feed water is not justified. After demon-

strating that the filter is not an essential feature of water softener construction, it becomes a simple problem to add any reasonable amount of pure water storage.

As a result of several years practical experience and study, having in mind the possible elimination of the filter, the softener at the foundry of the National Malleable Castings Company, Toledo, Ohio, as shown in Figs. 2 and 3, was designed and installed to soften and clarify hard and sewage laden muddy Maumee River water for boiler feed.

More rapid progress toward development of the "No-Filter" softener for purifying boiler feed water would have been possible except for the popular prejudice favoring the use of a filter of some kind. The average individual cannot conceive how it would be possible to simplify and improve a softener by omitting the filter. Several of these "No-Filter" installations having been made, and having demonstrated their fitness to meet the requirements, the construction of a "No-Filter" softener equipped to store purified water, has become a commercial proposition. A typical installation of this kind is shown in Fig. 4.

Somewhat more than the upper half of this tank, which is 10 feet high, is devoted to the storage of softened water. Fig. 5 shows the general arrangement of this softener.

The water enters at the inlet and passes to an over-shot water-wheel which furnishes the power to drive the agitator in the softening tank, as well as the agitator in the chemical tank at ground level. This same power also operates the chemical feed pumps. One of these pumps delivers the chemical solution to the chemical regulator located on the chemical tank, and the other elevates the solution which has been measured by the chemical regulator, to the top of the softening tank, where it meets the raw water which has passed over the waterwheel.

The downflowing water and chemicals are thoroughly mixed in this softening tank, during a period of twenty-eight to forty-eight minutes, depending on the amount of water in the storage space. When operated at less than the rated capacity of 50,000 gallons per hour, the time of flow is proportionately longer. The action of the softening tank mechanical agitators in preparing the precipitate for sedimentation is described below and is shown in Figs 7 and 8.

From the softening tank the water flows upward through the settling space at a rate of 3.61 feet per hour, which is sufficiently slow to effect clarification of this particular water. The time of flow from the bottom of the softening tank to the outlet corresponds to 4.4 hours when the softener is operated at rated capacity.

There is available for immediate use 308,000 gallons of softened water above the outlet. This volume is sufficient to meet the demands of a large locomotive terminal and freight yard.

Fig. 6 shows in detail the manner of handling the chemical solution. The reagents used are hydrated lime and soda ash.

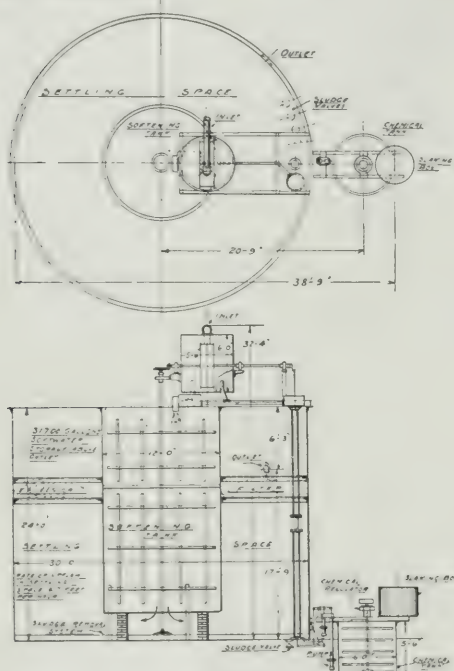


Fig. 1.

The low lift pump takes its suction through a strainer screen near bottom of chemical solution tank. The solution is delivered to the inlet compartment of the chemical regulator, mounted on the chemical tank. The level of the solution in this compartment is maintained at constant height, for the reason that sufficient solution is delivered into it to keep the solution continually overflowing the inner weir. The excess solution returns to the chemical tank. A uniform flow of solution, sufficient to treat 50,000 gallons of water per hour, from the inlet compartment flows through the standard orifices, which are always under a constant head. When the softener is run at full capacity, all of this solution is required; but if, for instance, it is operating at one-half capacity, as shown in the detail view of the chemical regulator, only one-half of the maximum flow of solution passes down the feed chute to the high lift pump, by means of which it is delivered to the softening tank. The other fifty per cent, which passes the cut-off plate on the other side, returns directly to the chemical tank. Similarly the feed is directly proportional to the amount of water entering the softener for all other rates of flow. The chemical regulator cut off plate is actuated and controlled by a float riding in a tank supplied with water which has passed over the waterwheel. The varying heights of water in the lower part of the wheel box are transmitted to the float tank through an equalizing pipe.

The outlet for the hard water from the wheel box, into the softening tank is through a Sutro weir, the general shape of which is shown in the detailed view. The extreme width of this weir opening is 25 inches. In view of the fact that the height of the water flowing through the Sutro weir is at all times directly proportional to the quantity, it will be seen that the vertical movements of the regulating float are always proportional to the quantity of water flowing. The vertical movements of this float are transmitted by means of a lever, links, and bell crank to the cut-off plate of the chemical regulator, and thus control the proportional feeding of the chemical solution.

Aside from a liberal design of settling tanks, there is one other important feature of this type of softener which materially assists the settling tank to deliver clear water. This is the provision for mechanical agitation in the softening tank. The agitation is continued sufficiently long not only to thoroughly distribute and mix the chemicals with the water, but also to insure coagulation of the precipitate, so that it will settle promptly as soon as the quiet condition of the settling tank is met.

Fig. VII. is an example of the influence of mechanical agitation as compared with another softening experiment similar in all respects with the exception that only a slight mixing was given in VIII-B, the "un-stirred," whereas, VIII-A had been subjected to the kind of agitation which experience has shown to be the most sufficient for precipitates of this kind.

The photograph (Fig. 7) was taken at the end of three minutes following the addition of chemicals at the rate of 1.9 lbs. of lime and 1.2 lbs. of soda ash per thousand gallons. The raw water in this case had a hardness of 285, and an alkalinity of 235 parts per million, corresponding in grains per U.S. gallon to 16.6 and 13.7, respectively.

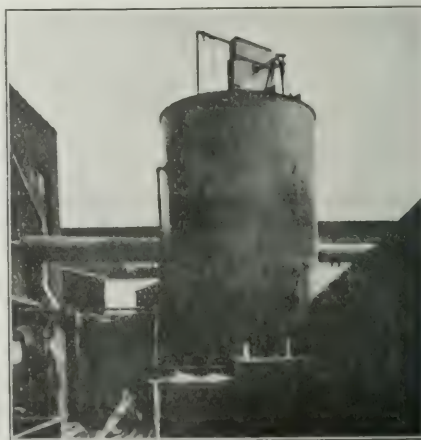


Fig. 2

In the experiment with Sample B there was only a slight mixing of the water caused by eight revolutions of the agitator whereas Sample A was stirred for three minutes, at the end of which time the precipitate had become fairly well coagulated. The slight blur in Sample A shows that while the stirring had ceased, the precipitate had not yet come to rest.

Fig. 8 shows the same samples, neither of which

has been touched since the first photograph was taken. The second photograph shows the difference at the end of six minutes, by which time the precipitate in Sample A had almost completely settled, whereas Sample B as may be noted, shows its precipitate to be very much behind in development.

These simple experiments demonstrate clearly the

advantage gained by the proper kind of mechanical agitation while the precipitate is in process of formation. As already stated, the use of mechanical agitation plays an important role in the "No-Filter" softener, which makes feasible the storage of a large volume of softened water in the same unit with the softener.

Some of the advantages of this softener are:—

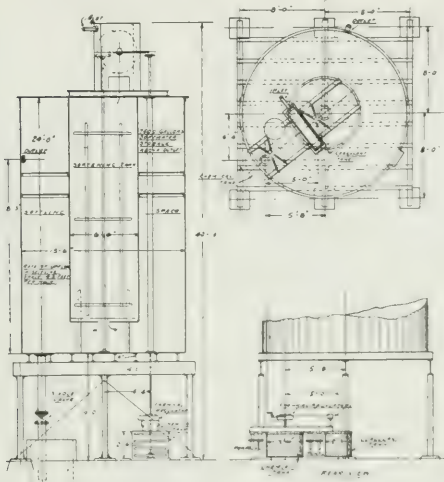


Fig. 3.



Fig. 4.

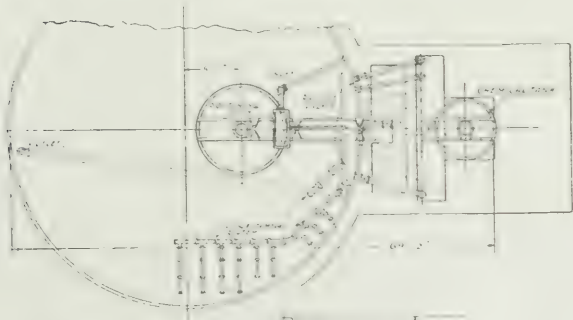
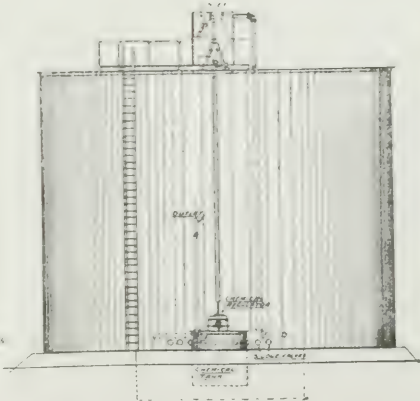
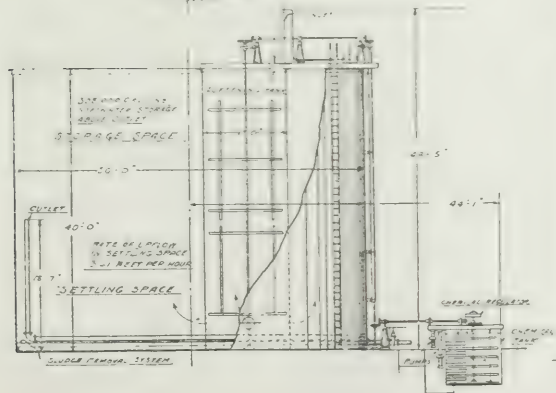


Fig. 5.



1. All handling and regulation of chemicals is accomplished at ground level.
2. Mechanical agitation for the softening tank is provided.

The combination of the softening and storage features results in a saving of ground space as well as in cost of the plant. No separate foundation is necessary. It is an important advantage that the water is

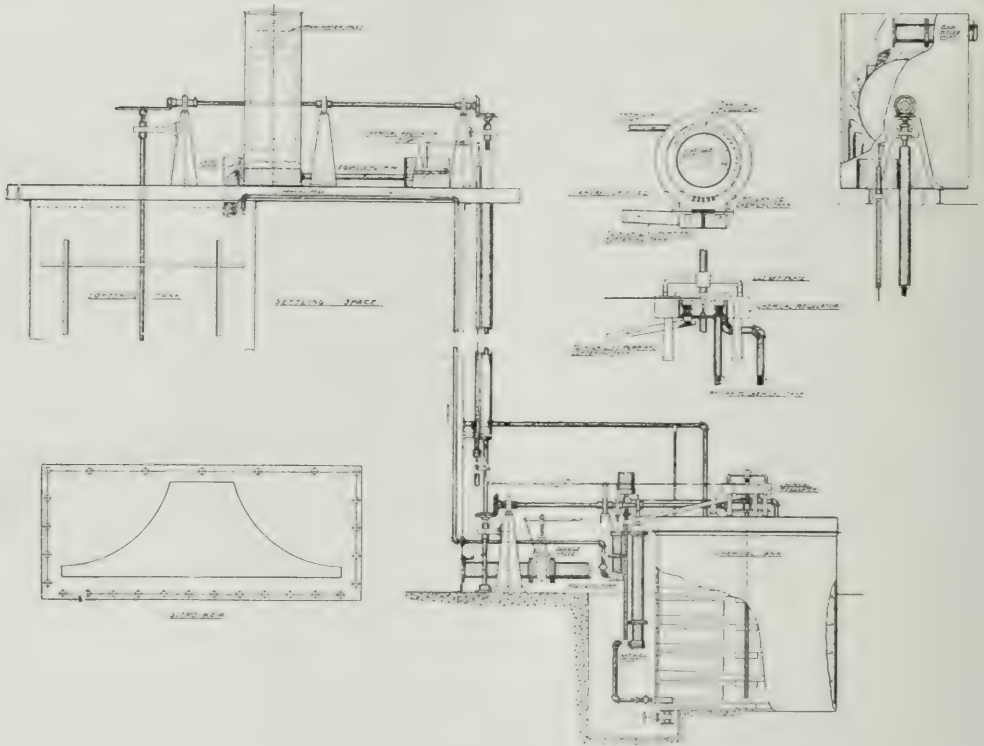
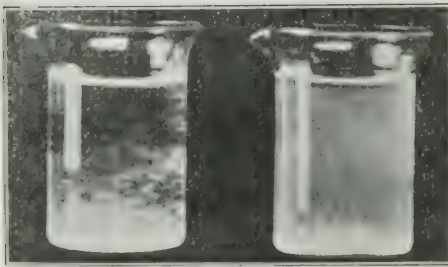
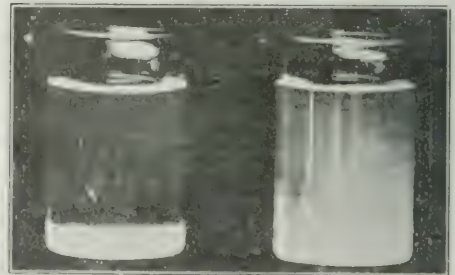


Fig. 6.



A B
Fig. 7.



A B
Fig. 8.

3. There is sufficiently slow upward flow in the settling space to deliver a clear effluent.
4. Convenient arrangement of storage capacity

stored at a considerable elevation suitable for delivery, without pumping, to feed water heater or locomotive tender.

THE CAUSE OF ROSIN BLEMISHES IN PAPER

By Prof. Dr. CARL G. SCHWALBE, Eberswalde, Ger many.

In an address by Prof. Dr. Carl G. Schwalbe delivered before the German Association of Pulp and Paper Chemists last June, which is reproduced in the "Wochenblatt für Papierfabrikation" for August 1, 1914, there are described the results of an investigation of the cause of rosin spots in paper and their avoidance. The investigation was very thorough, rosin and its transformations in all stages of cellulose manufacture, from the wood to the finished sulphite pulp, being made the subject of study under Professor Schwalbe's direction.—The whole is reproduced in a current issue of "Paper."

* * *

In studying the wood rosins it was necessary to differentiate between the rosin of well stored pulpwood and the rosin of freshly cut wood. The latter might differ materially from the former in its properties and it was also of great interest to know the changes occurring in entirely fresh wood rosin during storage. At Professor Schwalbe's request the government authorities had spruce and pine wood specially cut for these observations at the end of January of the present year. The wood was conveyed, immediately after cutting, to the Sandow paper and pulp mill, where the firm of Paul Steinbock, of Frankfurt-on-the-Oder, courteously had it barked and reduced to chips at once, so that the investigation could be started within five days after the felling of the timber.

We will first deal with the results of the investigation of rosin in well seasoned wood. Spruce yielded about 1 per cent, pine 2.54 per cent of substance soluble in ether and alcohol. We are, however, not justified in classifying these summarily as rosin, for they contain not less than 50 per cent of fat. It was known previously this rosin must be mixed with some fat from the cellulose contents, but it was astonishing to find so large a volume of fat. This fat differed conspicuously from the oleic acid which is combined with glycerine, but it gave the characteristic reaction for linoleic acid, a discovery similar to that made known by Bergeström in the composition of what is known as "talloil," the oily substance separated from the waste liquors of soda cellulose. The rosin contained in the rosin-fat mixture closely resembles the ordinary rosin, and the mixture is soluble in petroleum ether, to the extent of about 60 per cent. This portion appears, as will later be shown, to be the injurious element which is responsible for the rosin spots.

The rosin-fat mixture soluble in ether or petroleum is distinguished physically by its fatty oil appearance. The fat it contains is the cause of this general condition, for if rosin and fat are separated we obtain only fat and a brittle, hard rosin.

According to other authorities, turpentine is an important component of wood rosin. In the tests for turpentine it was determined that neither by steam distillation nor by vacuum distillation could turpentine be extracted from the seasoned wood; nor could it be extracted from spruce or pine. However, as a result of alkaline cooking, pine yielded small quantities of turpentine, a discovery to which we shall later refer in discussing the rosin of freshly cut wood.

If the wood rosin is exposed to a prolonged drying, say, for 150 hours, it undergoes only insignificant transformations, nor are important transformations effected by exposure to the effects of dilute chlorine, ni-

trous oxide or ammonia. Consequently the rosin-fat mixture in normally seasoned wood has in the main reached a permanent condition.

If, however, the properties of a rosin-fat mixture obtained from a quite freshly felled wood are compared with the wood rosin previously described, the quality will be found to differ. Perfectly fresh wood rosin is obtained from spruce to the amount of 1.6 per cent, as compared with 0.98 per cent from seasoned wood, for the fir the corresponding figures are 4.9 as against 2.54 per cent. The extreme solubility in petroleum ether of fresh rosin—90 per cent as compared with 68 per cent—is also notable, the high iodine figure being likewise characteristic. The transformation of the fresh rosin, when the wood is reduced to the form of chips, proceeds with remarkable rapidity. The wood is stored in the open, being protected only against rain or snowfalls at night, and if necessary during the day time. After twenty-four hours, three, ten, and seventeen days rosin extracts were made and investigated. After seventeen days the permanent constituents approximated those of well seasoned wood. In the form of chips, there is attained in two to three weeks a seasoning effect which in the log form would require about two years. These chemical transformations of the fresh wood rosin indicate certain physical changes. The rosin-fat mixture becomes more viscid, hardens gradually, a condition that occurs more readily in spruce than in pine.

The behaviour of the freshly felled wood in the examination for turpentine is somewhat remarkable. Thus the presence of turpentine could not be demonstrated in ether extract, though turpentine is readily soluble in ether; on the other hand, turpentine could be separated by alkaline cooking at 170 deg. to 180 deg. C. and a pressure of seven to eight atmospheres to the extent of 0.1 from fresh spruce and 0.8 per cent from fresh pine. This confirms experience in practice, that turpentine cannot be driven off under 170 deg. C. This temperature is necessary, though turpentine in itself is volatilized with steam. We must therefore believe that turpentine can only be expelled from wood at this high temperature and pressure, and in presence of alkali. This is confirmed by the fact that from wood that has already been exhaustively extracted with ether turpentine may still be obtained by alkali-pressure cooking.

Subsequent research concerned the behaviour of the rosin during the digesting process. The question as to whether resin was dissolved at any stage of this process had to be determined. The incentive to this investigation was furnished by the claims of an American patent granted to one Clark, according to which, at a certain stage of the cooking, the upper strata of lye in the digester is richer in rosin than the lower, bottom strata, so that by a part discharge of the boiling lye it is possible to remove a large share of the rosin. In the tests, undertaken in small, experimental digesters, an enrichment of the lye could not be detected. It is true that the discharge of the lye by layers could not be accomplished with these digesters and it was necessary at certain periods to completely interrupt the cooking and test the lye as to its rosin content. Five cookings of one, three, five, seven, and nine hours' duration were made. In the three, four, and five-hour cooking, an insignificant increase in the am-

ount of rosin in solution was observed, the greatest volume of this dissolved rosin amounting to only 10 per cent of the rosin contained in the wood. The experiments showed that it was hardly probable rosin was rendered soluble or even emulsified by the sugar or other colloidal substances in solution. Complete assurance could only be obtained by continuous investigation for rosin in a large digester, with liquor taken from various depths.

The result of the experiments here outlined confirms the statement generally made that sulphite liquor contains scarcely any rosin, the rosin of the wood being bound up in the pulp to the extent of about 50 per cent; what remains appears to be changed into substances soluble in water that can no longer be extracted by ether or other organic solvents. If the average quantity of rosin-fat contained in spruce is calculated at about 1 per cent, and that in the finished pulp at 1 per cent, half of the rosin must have disappeared in the lye, otherwise the cellulose must contain 2 per cent of ether-alcohol soluble substances. It is premised here that only 50 per cent of the wood is converted into cellulose.

In the preparation of cellulose a portion of the rosin contained in it is separated. Thanks to the kindness of the Norddeutschen Cellulosefabrik, it was possible to obtain what is known as "screen-rosin" taken from the screens of the draining machines. This rosin proved to be almost wholly soluble in ether. The portion soluble in petroleum ether was similar to the portion of wood rosin soluble in petroleum ether, if not identically the same. As, however, it is the screen rosin that is indisputably the cause of the rosin spots occurring in the finished paper, the conclusion already reached, that it is the portion of the rosin-fat combination that is soluble in petroleum ether that constitutes its injurious factor, is quite justified. In comparison with the wood rosin, the screen rosin is somewhat richer in fat. The fat contains notable amounts of oleic acid. Linoleic acid appears to be no longer present, as in the wood rosin. The amount of fat contained in the cellulose rosin is most notable, constituting as it does 60 to 70 per cent of its bulk.

Concerning cellulose rosin a great deal has been published, at least as regards the quantity of the so-called rosin, which according to older statements was put at 0.5 per cent. Later determinations, made with about fifty specimens of cellulose, prove that about 1 per cent must be taken as the average contents. The rosin contained in cellulose is subject to a certain transformation on keeping in storage. The solubility of the rosin in ether becomes less, the iodine figure also declines, while its solubility in petroleum is also lessened.

The cause of rosin troubles is to be sought, according to these investigations, in the components of cellulose soluble in petroleum ether and principally in the fat present. This view was confirmed experimentally when in comparative tests with rosin and fat and mixtures of both in the formation of rosin bluishness in paper it was found that rosin alone produced no spots, that fat caused only slightly visible spots, whereas a mixture of rosin and fat resulted in typical rosin bluishness. The experiments were made with alkaline emulsions of the rosins, etc. They were thoroughly shaken up with paper pulp with the addition of solution of calcium chloride. By this means it was possible to effect a calling out of the rosin. The fatty oil made the little rosin plastic so that with other rosin particles it combined into large lumps which were then visible in the paper as rosin spots. In summer this

rosin-fat mixture is more plastic and more adhesive than in winter, consequently rosin troubles occur more frequently in summer when the air and water are warm.

How can these rosin spots be avoided? The most radical remedy would be the elimination of the rosin from the wood. In the patent records we frequently encounter the proposition that the rosin should be previously extracted from the wood with the aid of organic solvents. If, however, the quantity of required solvent for its complete recovery is considered and the danger from fire, it will be evident that such an extraction would pay only in the event of great richness in rosin. The loss in extractives in the case of alkaline emulsifiers such as caustic soda, ammonia, etc., would also be a serious consideration. This process becomes impracticable when it is understood that it calls for the heating of large quantities of fluid and the recovery of rosin from solutions containing very little rosin, while precipitation with acids is hardly possible.

Under the circumstances here set forth, the customary seasoning of the wood appears to be the most economical means. The only question is whether we cannot advantageously substitute for years of seasoning in the log storage of the wood for several weeks in the form of chips, bearing in mind the above discovered very rapid oxidation, possibly hot air, very dilute chlorine gas or also dilute nitrous oxide, might be employed on the wood. These auxiliary agencies have, however no effect on wood that has been stored for any length of time.

In view of the insolubility of rosin in sulphite liquor, the prospect of being able to get rid of the rosin during the cooking process is not very encouraging.

In counteracting rosin difficulties, the washing of the cellulose while in the digester or in the blow-off vat gives the best results. It is not apparent as to how a reduction in the rosin content can be effected by the rinsing off of cellulose particles, for a complete washing out of the particles is not accomplished owing to the short period of contact between the water and the pulp in the vat. Possibly the following method of looking at it may furnish an explanation. Cold, especially hard water could precipitate glutinous lye compounds on the cellulose particles. The fibres thus rendered adhesive in the subsequent washing attract in the sand traps the rosin particles emulsified in the washing water and contribute in this way to the formation of larger rosin aggregates.

An acid reaction of the washing water operates favorably on the removal of rosin. It is likely that the formation of a fatty lime salt, from interaction between the calcium constituents of the water and the free fatty acids of the emulsified rosin fat particles, is the active agent in throwing out rosin.

In addition to mechanical means of removing rosin, as, for example, slices, the removal of rosin from the cellulose by solvent or emulsifying agents suggests itself. The derozinating effect of hot alkaline solutions is well known, but the effect of such alkaline treatment on the character of the cellulose should not be lost sight of. There is, however, a whole series of substances capable of emulsifying rosin and fat. To obtain an insight into the operation of such emulsifying agents, a series of experiments were made with caustic soda, soda, ammonia, soap, tetrapol, and borax. The experiments referred to went to show that soda and caustic soda always worked best, that borax too is good for removing rosin without any detrimental action on the cellulose. Tetrapol, a combination of cas-

for oil, soda soap, and tetrachloride of carbon, while expensive, was effective.

As all these substances are alkaline they cannot be used in chemical pulp plants where the washing water is acid. If, however, the acid is removed their action may be influenced by the hardness of the water. Alkali must therefore be used in larger quantity according to the hardness of the water. An acid-emulsifying agent for the rosin-fat mixture would for that reason be desirable. Little is known of such substances but, in regard to price, what is known as the Twitchell re-agent, a product obtained by the sulphurization of oleic acid and naphthalene, may be considered. Twitchell's re-agent is recognized as an excellent emulsifier of fats. Unfortunately it fails with cellulose rosin, only 41 per cent of the rosin-fat mixture being emulsified and removed by it. The emulsifying agents mentioned were used on cellulose pulp of a density of 7 to 8 per cent in quantities amounting to at most 7 per cent of the weight of cellulose.

It is quite likely that such agents would work well when employed with even higher pulp concentrations either in the kollergang or in the pulp kneader, and so increase the concentrations of the reagents in regard to the volume of water. Such problems can only be solved by experimentation on a large scale, experiments to which the scientific investigations such as here described—above all the knowledge that it is not with rosin only but with rosin-fat combinations that we have to deal—will, it is hoped, furnish the incentive.

Norway and Denmark

A special report on conditions in Norway and Denmark by Mr. C. E. Soutum, Dominion Commercial Agent, throws light upon a most interesting situation. Mr. Soutum says that it was sad tidings also for the Scandinavian pulp and paper manufacturers, when they learned of the outbreak of the European war. Most of them had only very small stocks of coal, and for a start there was no occasion to make shipments, as most of the steamers laid up on account of the great risk of keeping them running.

An almost total closing up of business was in view, but after the first shock every day seems to bring hope for the mills, that they shall be able to keep going without too much restriction, since the supply of coal will again commence. Steamship connection with Great Britain is now considered fairly safe for neutral steamers, and there has been established a special Government insurance for war risk, so the oversea connection is also again coming in fair order.

According to an article in the Norwegian Trade Paper "Farmand" for August 22, the paper, pulp and cellulose mills will therefore be busily engaged in sending forward supplies on running contracts, charging, in case of c.i.f. sales, to the buyers the cost of extra freight and war insurance.

As yet much fresh business has not been done in mechanical wood pulp. While \$10.67 net f.o.b. would be a reasonable price, taking all circumstances into consideration, the majority of the mills who have anything unsold are asking from \$0.53 to \$1.33 more. Twelve dollars is a somewhat stiff price, but it cannot be characterized as unreasonable; there are a few mills, however, who name fancy prices. By doing so they run a risk of missing a good opportunity to obtain a remunerative price for their unsold balances.

There is however, really no over-production; stocks do not accumulate, and the unsold balance of the production of the current year is a small one. Although there is sufficient water in most of the Norwegian rivers (though not in the Drammen river), a great water scarcity in some parts of Sweden is reported, particularly in those districts which ship their pulp over the West Coast or Norwegian ports. It may not be impossible to draw pulp from the Baltic, but shipments from that part will be uncertain, and freights will be high. It ought to be possible to come to an understanding between buyers and sellers under present trying circumstances, if both approach the matter in a reasonable and loyal mood, without trying to overreach each other.

There has been quite a boom in the cellulose market, and prices have advanced from \$8 to \$9.33 per ton. For "easy bleaching" sulphite prices varying from \$45.33 to \$48 net f.o.b. have been paid, and it seems that there are still buyers in England at the highest of these quotations. "Strong" has commanded \$42.67 to \$44.

Some of the North of Sweden mills have stopped already, others are run with reduced output. If these mills cannot get new supplies of coal and sulphur, a general stoppage during the autumn will be inevitable. If prices go sufficiently high, it will, however, be possible for these mills to get supplies through the cities of Trondhjem or Narvik, in Norway, and to ship their produce that way; indeed, it is reported that an offer f.o.b. Narvik has already been made.

A week ago there arrived from Russia what will probably be the last shipment of pulp wood which the Norwegian mills can obtain from there for some time, as export of wood material of all kinds is now prohibited from Russia during the war. This will mean a break-off in the production of those mills that have counted on their supply of raw material from Russia. One mill alone is reported to have orders with Russian exporters for about 12,000 standards, which they now will not receive, and it may be difficult to secure sufficient raw material in a hurry to keep the mills of this company running steadily during the coming months.

Exceptionally low water in the Swedish rivers has for some time made the floating of logs impossible, and of 13,000,000 logs destined for the pulp mills, only 6,000,000 have been floated so far. If there does not soon come abundant rain, the situation for the mills depending on these logs will be critical. Earlier in the summer, when there was plenty of water, the floating was stopped through a strike by the laborers.

The war has already caused the paper prices to go up 60 per cent. Of what importance this is for the paper mills may be understood, when it is stated that the paper export from Norway during the first six months of 1914 reached about 96,000 metric tons. Every week there is now shipped large quantities of paper, especially to England. The question is only how long it will be possible for the mills to get sufficient supply of coal.

The law recently put in force about the insurance of Norwegian vessels against war risk prescribes that the Norwegian Government guarantees 80 per cent of the insurance. The premium is not to exceed 12 per cent per year and 1½ per cent of the amount of the insurance. All vessels that are bound to register must insure, with the exception only of such vessels as previously carried insurance against war risk, as long as such insurance is in force, ships in the coast and lake traffic, fishing boats and ships that are laid up in a safe harbor.

THE BRITISH PAPER INDUSTRY AND PULP TRADE

(From Our Own Representative.)

It has required nothing less than the most terrible war that Europe has ever witnessed to lead some of us, lay and technical, to worry our heads about the extent and character of Germany's and Austro-Hungary's foreign trade connections and the need for strong action in order to deal properly with the menace. Yet, while in a trading sense, at any rate, Germany and Austro-Hungary lie hors de combat, we ought to rise to the occasion. British paper manufacturers are moving quickly. What are Canadians doing, and what steps are they taking to expand the interests of the pulp and paper mills? That is a question we must ask ourselves seriously. I see a golden opportunity before Canada and if it is lost now it may never be regained. The British paper manufacturer also sees his opportunity and to enable him to capture German and Austrian markets he has called in the assistance of the Trade Board and all the other departments abutting on to it. Canada must and can do the same. Let it be remembered that this storming of the citadel of German trade by the guns of German militarism has come at a very important juncture in the great industrial movement in Canada in the pulp and paper trades. As I have already explained in previous articles, German mills are shut down and the British Navy is lying off all German ports to see that not an ounce of food, let alone pulp and paper, will be imported or exported. That is the condition of things so long as the war lasts and when hostilities are over German pulp and paper producers cannot pull themselves together for many a year to come. Then as to German and Austrian credit and finance who can predict the position in this connection, and what the effect upon industry may be? There are other important factors which are not to be lost sight of, but the Press Censor has to be considered, and I am forbidden to mention them. The moral of the situation is—there has been enough talking, and the time has now arrived for Canadians both individually, collectively and in co-operation, to resolve to do something to capture some of the trade of our rivals at home or abroad and to show a willingness to adapt ourselves to buyers' requirements, instead of trying to compel him to change his ways for our benefit.

The Paper Industry and Paper Trade.

In the British paper industry there is no sign of a lull as regards pulps, and manufacturers are kept fairly busy considering that the export trade has been somewhat dislocated. So long as the pulp comes in the demand for paper is found to be good and prices have gone up to the extent of 5 and 6 per cent. In the paper trade, that is amongst the jobbers and agents and merchants, things are not so healthy. The war has, of course, killed the business of those who solely represented German and Austrian firms, whilst agents for the Scandinavian mill have had their supplies curtailed, which means reduced profits, but their position is not as bad as one might expect. Agents and merchants representing British, Canadian or American mills are the better off and their only grievance is that they cannot meet the demand. The great rush is on news-print and the printing paper, and the supplies so far have been excellent. Some people at first became alarmed when the war broke out, and the opinions of these alarmists were intensified by the notices that appeared in the daily and weekly newspapers. As a mat-

ter of fact, these alarming newspapers had their advertisements stopped and they accordingly cut down the sizes of papers to meet the new conditions. Other periodicals and papers published weekly stopped altogether, not for the want of paper to print on, but for the want of advertising matter to help the revenue in the profit and loss accounts. The excuse then presented to the public was the threatening of a paper famine. Of course, most of the large daily and evening papers in the United Kingdom are conserving their paper supplies and for this they cannot be blamed. But to speak or write of a paper famine is so far a remote turn in forecasting events. Indeed, I was speaking to a large newspaper proprietor some days ago, and he told me that he had just given out a twelve months' contract for newsprint to one of the English mills, and it may be inferred that if the mill could not meet the large demand, the grave risk of signing the contract would never have been undertaken. The mill incurs enormous liability under the contract. Newsprint is now selling at three cents to four cents per pound, but as I have already pointed out, it is an impossibility to say what the consumption is in the United Kingdom and any figures published dealing with the output or consumption, are only the result of an imaginative mind. Mills do not make a report on what they produce for public information, and what comes in and goes out of the country can only be gauged through the government reports. According to these reports the following were the imports and exports:—

August.		
	Cwts.	Cwts.
	1913.	1914.
Imports	1,131,897	630,227
Exports	280,171	223,259

January to August.		
Imports	8,537,967	7,921,584
Exports	2,389,157	2,202,575

On August 4 war was declared, and considering what the country has gone through, these figures are not very disappointing. They include paper and boards, packing paper and so on. A few details as to reel and other paper may be interesting; the figures showing cwts.:

Imports in August.		
	1913.	1914.
Reel paper	294,485	303,157
Unreel	72,155	33,256
Writing paper . . . . .	.....	.....
Printing paper . . . . .	.....	.....
Packing paper	343,732	130,385
Wall papers	1,897	236
Exports in August.		
	1913.	1914.
Reel paper . . . . .	.....	.....
Unreel . . . . .	.....	.....
Writing paper	19,514	14,830
Printing paper	151,407	121,627
Packing paper	76,587	59,821
Wall papers	6,335	4,412

Germany is a large supplier of the foregoing paper to the British markets and the result is the Teutons have been knocked out altogether, in addition to Austria. Some of the German trade in neutral countries is already finding its way into England and Canada would do well to watch all British possessions, like New Zealand, Australia, etc.

Ground Wood and Chemical Pulps.

There is very little new business being transacted in ground wood and chemical wood pulps. Nearly all the mills have very fair stocks of ground wood, and shipments against running contracts are daily arriving, thanks to the British Navy which has already cleared the sea route for shipping purposes. Chemical pulps are also arriving in large quantities, but prices for new parcels are gradually going upon a higher basis and the Swedish and Norwegian mills are doing their best to get record prices. Buyers are consequently holding off. The arrivals of pulps during August, since the war broke out, compared with August 1913, were as follows:—

August.

	Tons. 1913.	Tons. 1914.
Chemical Bleached, dry	1,375	1,683
Chemical, Unbleached, dry	32,360	16,782
Chemical, Wet	816	980
Ground Wood, dry	644	.....
Ground wood, moist	44,945	32,575

Out of the total quantity of ground wood Canada supplied 7,876 tons, compared with 3,625 tons in August 1913, or 49,269 tons from January to August, as against 32,741 tons during the same period of 1913. Since then, up to September 5, the last Custom House return before me, the British market has received 370 tons of bleached chemical dry; 12,620 tons of unbleached chemical, dry; 1,184 tons of chemical, wet, and 29,441 tons of ground wood moist. Of the latter, Canada supplied 9,628 tons, and Newfoundland 2,912 tons. With these shipments all traces of a paper famine should be deleted from one's mind. Shipping is now constant between Scandinavia and Canada, and judging by it, I often ask myself the question: "Are we really at war?" Scandinavian paper is in the market as well as plenty of Scandinavian pulp. But putting all things aside there is an unsettled feeling prevailing, and this must be expected. Prices are now in or about the following: Groundwood, moist £2 5s to £2 15s; sulphite bleached No. 1 £13 to £15; easy bleaching No. 1 £11 to £12; "news" or strong quality sulphite, £10 to £11; soda unbleached No. 1 about £9 to £10, soda kraft £10.

Shipments from Norway are more regular than those from Sweden, owing to the mined state of the North Sea. So long as the Scandinavian mills can get coals, sulphur, and chemicals, the supply of pulps to England may be considered as regular, but to predict anything as to the quantities and prices is beyond one's comprehension at present. It must be remembered that Germany, Austria and Finland are out of the pulp world at present, and for some time to come. It is stated freely in Copenhagen that Norway will be selling ships to Americans very shortly on a large scale, as the States are anxious to build up a commercial fleet and to pay four hundred million dollars for it. "It is a splendid opportunity for Norway," said a Christiania man to me the other day, "and no doubt the pulp and paper trades will benefit."

Esparto Chemicals and Fillings.

Manufacturers of esparto papers have received a severe check owing to the shortage of the raw material. Few sellers will now venture to make new arrangements for the sale of esparto and there is a strong enquiry from nearly all the consumers. Prices have gone up enormously and the shipments to Scotland and England in August were something like 4,000 tons less when compared with August 1913, which not then even a good month for arrivals. There is also a keen demand for rags and waste papers, and prices are soaring high. Supplies, however, are very fair. America is largely in the market for waste papers and shipments from England lately have been heavy. Chemicals are slightly dearer, but as things are being gradually evolved on a quieter basis prices are going down somewhat. Stocks are good and the demand on home account is satisfactory. China clay contracts for 1915 are being made on easier terms, when compared with 1914, but other fillings, like mineral white, are slightly dearer owing to extra expenses which the war has thrown on the producers.

The Dilation of Printing Paper Owing to Moist Air

Complaints about defective register when printing several colors are constantly met with in technical journals. As is well known, paper expands when it becomes moist and contracts on drying, so that printing papers must be prevented from drying or absorbing moisture between printing the various colors. The humidity of the air and consequently the percentage of moisture in the paper depends, however, on the temperature of the storing and working rooms. Frequently the work room is a cellar and too moist. In addition, insufficient ventilation is lacking for supplying the requisite drying air. In such rooms the papers which was subsequently to be employed for polychrome printing should always be placed for some time before being used into waste paper of a uniform temperature and be stored in the printing room. The immediate proximity of hot stoves, steam pipes, and draughty places must be avoided. When the printing paper is stored in large piles and in moist places the moisture is absorbed only at the edges and causes corrugations here, so that folds are made in the paper on beginning to print. In the case of single color work these small folds are of little importance, but when printing with several colors they are very troublesome because the individual prints can never register exactly. In papers for polychrome printing the various dilation of the paper in the direction of the machine and in the transverse direction must be regarded during the manufacture of the paper and negated as much as possible. These papers are, therefore, sent not only through the roll super-calender in the direction of the machine, but also, after being cut to the correct size, in the transverse direction through the sheet super-calender. The dilation of the paper is thereby negated as much as possible and the difference of dilation in the direction of the machine and the transverse direction is diminished. The printer should be informed which is the machine direction of the sheet. This is determined most simply by cutting out of the paper a circular disc about 10 cms. in diameter and placing it flat on the surface of water in a saucer. The top side of disc must not be moistened. After removing the paper

from the water it begins to roll up, two opposite points of the periphery of the disc rising towards one another. The diameter of the disc remaining rectilinear is the machine direction.

In lithography, in addition to the difficulties of the registration of the sheets there is also that of color printing, i. e., the connection of paper and ink. In this case, the grounding with varnish which is so necessary is frequently neglected for reasons of economy. When cheap kinds of paper are used in addition, trouble in the form of loss of time stoppage of the machines and waste is soon met with. The temperature of printing works for polychrome printing should be, as a rule, 15 deg. C. In rooms lit from above the maintenance of this temperature is particularly difficult, because in summer the sun is very powerful and in winter moisture readily enters. In such cases, the top sheets of the pile must be covered carefully in order to prevent them rolling up and forming folds. In addition, proper equalization of temperature should be provided for by providing ventilators. The so-called skinning met with when piling the printed sheets on one another can be prevented by the mixing of the inks with liquid sicative being avoided as much as possible, for this drying agent negatives the absorption of even the best printing paper when first printed, so that the second print is not held sufficiently by the paper. A skinning layer, which dries very slowly and, of course, prevents any other color being absorbed, is formed on the places already provided with ink. The inks lie without any hold on the layer and the finely pointed shades are squeezed apart. In this case, frequently, only treatment of the separate sheets with talc is a remedy.—Der Papierfabrikant.

Economical Operation of Paper Machines

Carelessness and neglect in the treatment of the paper machine and its spare parts may, as is well known, lead to great expenses. It is, for instance, not advisable to have only one long piece of hose lying at the side of the paper machine, as its length makes it difficult to use, and it is subject to a great amount of wear by being constantly pulled backwards and forwards along the floor of the machine. There are, of course, such hose which are provided with a metal spiral or hemp twine spirals to protect them against the rapid wear. This however, deprives the hose of its flexibility. It is much more practical to employ a number of shorter pieces of hose at various parts of the machine instead of one long length of hose. This further enables water to be given at several places at the same time, so that the cleansing of the wet and takes place with much more rapidly and the pipes become shorter. A piece of hose should also be fixed in the neighborhood of the pulp chest so that the latter may be cleaned when necessary. If special circumstances demand the use of a long piece of hose, the latter should not be allowed to lie upon the floor, but should be hung by means of hooks at the side of the wet end. This not only saves the hose but removes the danger of the attendants stumbling over the same. Further, hose should not be allowed to lie for an great length of time in one position on iron or other metal parts, as some kinds of rubber become hard and brittle at such places. It is advisable to

wrap such iron or metal parts with a piece of old rubber, felt or the like, in order to prevent any direct contact. Hemp hose, notwithstanding impregnation, is not serviceable on account of the wet conditions. The hose should have such a length as to allow of its being shortened once or twice at the end where it is fixed to the mains (at which place it is well-known the hose suffers most severely) without being too short.

Deckle straps are still more expensive than hose, and should be carefully protected against grease and oil. Any spots which may occur should be immediately removed with warm soda lye or benzine. Care should also be taken that the wire and the deckle strap have exactly the same speed, as otherwise the latter would wear and become rough by the friction, as a result of which the edges would lose their sharpness. The guide rolls of the deckle straps should be provided with cups to prevent all dropping of lubricating oil. The guide rolls should rotate with the least possible friction. Further, heavy deckle straps, for instance in the case of Fourdrinier cardboard machines, are best driven from the couch roll.

Wherever possible two strainers should be provided, so that in the case of one being stopped up it could be simply cut out and cleaned without having to stop the machine. In cases where papers which require exceptionally fine sorting, both strainers can be employed at the same time, the one strainer being placed somewhat higher than the other so that the pulp after passing the first strainer, immediately enters the second, which is provided with much finer slots. The slots of the strainer should never be cleansed or scraped with pieces of sheet steel, hoop iron, and the like, as the slots are widened by this process. Soft bronze wire or stiff sea grass brushes are most suitable for this purpose. On the inside the slots should be cleaned by means of a flat piece of medium hard wood cut to a sharp edge on one side; with this the slots are rubbed backwards and forwards, whereby the thin piece of wood pushes the knots over to the other side where they can be easily brushed off. Flat strainers should be so erected that they can be easily raised into a perpendicular position. It is, for instance, possible to erect a winch on the outside of the pulp chest, and connect the same up to the frame of the strainer which is to be cleaned by means of a wire rope. This device works much quicker and is much safer than lifting the heavy frame up by hand.

Froth blisters are a frequent cause of breaks in the paper. The formation of froth often takes place as a result of the back water from the wire, containing a concentration of froth-forming stuffs, being repeatedly employed, and sometimes as a result of the stuff having too great a drop from the pulp chest to the wire. To remove the froth before the gate a shower pipe should be fitted, pointing almost vertically upwards so that the falling drops destroy the foam.

For removing wrinkles the tender should have an ample supply of strips of paper or multi music of various widths always at hand. Strips of felt or old pieces of belting should also always be kept in readiness in order to be able to regulate the tension between the various parts of the machine at any moment. For fixing these strips on to the belt pulley a mixture of 50 parts of molten resin and 50 parts of drip oil, which should also always be kept in readiness, in use, has been found to give excellent results. The latter points will probably appear superfluous to some paper-makers, but the observation of the same was found to save much waste paper.—Der Papierfabrikant



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

A government return has been issued showing the trade between Canada and the United Kingdom in 1913. It shows that a considerable increase has been made in the sale of pulp, strawboard, millboard and wood-pulp board, to English and Scottish buyers; but there is a regrettable falling off in the sale of printing and writing papers, which Canada exported to the extent of 58,452 cwts. (valued at £31,572) in 1913, compared with 77,015 cwts. in 1912, 99,652 cwts. in 1911, 186,900 cwts. in 1910, and 326,146 cwts. (valued at £161,793) in 1909. These figures show that the Germans have captured a large portion of the Canadian trade in Great Britain, along with the Scandinavians, and there is a great chance now for manufacturers in the Dominion to regain what they have lost. The outlook as regards millboard, wood-pulp board, and strawboard, is very cheery for Canada, but to retain trade and develop it manufacturers must keep a very close eye on the market of the United Kingdom. In 1913 Canada exported to the English and Scotch market 230,546 cwts. (valued at £106,043) of mill, wood pulp and other boards, as against 217,771 cwts. in 1912, 193,865 cwts. in 1911, 199,276 cwts. in 1910, and 132,687 cwts. (valued at £59,433) in 1909. These figures show an excellent increase in trade, which is well worth conserving. In pulp the supplies from Canada reached 69,357 tons, compared with 42,398 tons in 1912 and 33,563 tons in 1911. The exports of the British mills to Canada in 1913 were: Paper of all sorts, 172,158 cwts., compared with 178,067 cwts. in 1912, and 152,854 cwts. in 1911; papermaking materials, such as rags and wastepapers, 9,596 tons, compared with 9,656 tons in 1912 and 9,531 tons in 1911 and 10,025 tons in 1910.

* * *

Thanks to the foresight of Lord Northcliffe and those associated with him in London, Newfoundland is gradually occupying a conspicuous place in the paper and pulp imports of the United Kingdom, and in this connection credit must also be given to Mr. A. E. Reed, one of the most hardworking and most straightforward men in the British industry. Comparing last August with August 1913 paper received from Newfoundland has increased by 28½ per cent in the imports and by no less than 154½ per cent when compared with August, 1912. The actual imports from Newfoundland into the British market are: Reel paper, 860,123 cwts. (valued at £428,066), in 1913, compared with 790,653 cwts. in 1912, 523,116 cwts. in 1911, and 340,365 cwts. in 1910; pulp 50,659 tons (valued at £123,098) in 1913 compared with 41,768 tons in 1912, 30,454 tons in 1911 and 12,291 tons (valued at £31,463) in 1910. Of course, it may safely be said that Newfoundland is a keen competitor in the British market with Canada as regards reel paper, or newsprint, and she has also captured a small proportion of the Canadian pulp trade. In return for these imports British mills export to Newfoundland paper of all kinds, which, according to the latest return issued by the government, reached 3,773 cwts. in 1913, 4,677 cwts. in 1912, 4,056 cwts. in 1911, 4,056 cwts. in 1910, and 4,466 cwts. in 1909.

The British paper mills are showing great patriotism in connection with the war. There is hardly a mill but has been hit in some way or another, and if the owner is not on military service he has his sons or some of his employees in the army. In nearly every case the dependents of the men at the front are being provided for by the men at the mill or the mill owner. Here is an example of one of the typical letters that has been addressed to employees, in this case from John Dickinson and Co., who own three large paper mills and employ hundreds of hands—"While we feel that it is our duty to endeavor to keep our works going, subject to this we desire to urge the men in our employment to enlist in His Majesty's Forces. But as it is not in the best interests of our country that any should leave whose absence will stop the work of others, all who desire to enlist should first consult the foreman of their department. Places will be kept open for all who leave with the consent of the company. Half wages will be given to all who are married or who have dependents, and one quarter wages to all unmarried men, and a bonus of one month's wages or salary will be given to all those who return to the company at the end of the war." Messrs. Bentley and Jackson, the well-known papermakers' engineers, of Bury, have lost 14 of their men who have joined the troops. But work is going on all the same, and to the wife of each man Messrs. Bentley and Jackson are paying \$2.40 a week, with an additional 24 cents for each child who is not of working age.

* * *

Producers of china clay in Canada, owing to the war, have now a great opportunity of showing up their products and expanding trade. From Fowey, in Cornwall, England, shipments cannot be made regularly until the European crisis is over, and meantime Americans are getting very nervous about future supplies. During August 30 198 tons of china clay was exported, compared with 39 176 tons in August, 1913. Of course, the reduction in these figures is not much to complain of, but then it must be remembered that the position of Fowey is not a good one for making shipments from in time of war. Then, again, labor has been reduced owing to the men being called away to the army, so that practically the output of china clay has been reduced to the extent of 10 or 12 per cent, without any change in prices.

* * *

The Germans have always taken the lead in the production of dyestuffs and coloring stuffs for the paper trade, and in this respect they have been difficult to beat. In England, however, the production of dyes, colors, and so on, is in the hands of very capable firms, like Read Holliday and Sons, Ltd., of Huddersfield, who are leaving no stone unturned now that the British Navy has looked up the German coast and killed all Teutonic shipping. The president of the Trade Board has also taken up the matter and he is considering the best means of obtaining for the use of British industry sufficient supplies of chemical products, dyestuffs, etc., largely imported from the countries we are at war with. Canadians, however, if in doubt could not do better than write Read Holliday and Sons, Ltd., if stocks are down.

Mr. Hans Lagerlof, the president of the Scandinavian-American Trading Company, New York, was in London the other day on a short visit. Mr. Lagerlof was in Hamburg when war was declared and he remarked that beyond mobilization work, business was going on as if nothing had happened. He made his way to Sweden, and as time passed, the Swedish mills were suffering from the want of coal and sulphur. The call up of the Swedish army has also seriously affected labor in the pulp and paper mills, many of which are now closed.

Mr. F. E. R. Becker (Messrs. Becker and Co., Ltd., pulp importers, London) has been selected to serve upon the Arbitration Board, appointed by the British Admiralty, to deal with matters arising out of the requisition of ships for service in the Royal Navy during war time.

At a board meeting the other day of Edward Lloyd, Limited, the half-yearly dividend due on October 1 was declared on the five and a half per cent cumulative preference shares. In view, however, of the financial situation arising out of the war and the necessity of conserving the company's resources, the company resolves that it is not possible to declare an interim dividend on ordinary shares.

Messrs. J. Marx and Company, Paper-Mayers' Engineers, London, are unable on account of the war, to keep up the relation which has existed with Messrs. Thiry in Belgium and pending hostilities with Germany will manufacture their special and patented paper making apparatus in England to the fullest extent. They report that their preparations for this are well advanced and facilitated by the fact that a good many specialties were built in England a long time before the war.

One of those prominent in the paper industry who has been commissioned for service in the British army is Mr. R. Marx, Jr., who has for the time being exchanged his profession as an engineer for a commission as Lieutenant in the Royal Field Artillery of the Regular Army, for which his previous connection with the Officers' Training Corps of London University should be a valuable preparation.

CANADIAN PULP IN JAPAN.

The Department of Trade and Commerce says that Canadian pulp manufacturers have now an opportunity to do a profitable business with Japan. In Weekly Report No. 537 it will be seen that Germany and Sweden have nearly the whole of the export trade in pulp to Japan amounting to \$1,850,000 out of a total trade of \$2,100,000. As a result of the war, exports from Germany have entirely ceased, and those from Sweden are bound to suffer. In consequence the price in Japan has gone up by 20 per cent for pulp of a medium quality and will probably go higher. No doubt a large part of this increase will be eaten up by increased freight charges and war risks, but it is a good opportunity for Canadian pulp manufacturers to get a foothold in this market. Pulp of a medium quality was quoted before the war at 8 sen 4 cents per pound. The duty is \$1.67 a ton. The largest dealers of importances are the Mitsui Bussan Kaisha, 1, Shingachō, Nishimbashi-ku, Tokyo.

The manager of one of the largest American importing houses in Japan stated that there is such a shortage of sulphite pulp in this country owing to ship-

ments from Scandinavia via Hamburg having entirely ceased, owing to the war, that price is hardly a factor, and the only question is one of supply. This firm sold last week a large quantity of very poor American pulp ("almost black," he said) at 50 per cent above normal prices, and can dispose of any quantity of Canadian pulp offering, at high prices, throughout the war. Nearly the whole of the imports of pulp into Japan have been Scandinavian in origin, shipped in German bottoms via Hamburg, so that the normal source of supply is entirely cut off.

OPPOSE FELT MAKERS' SPECIFICATIONS.

(Special to Pulp and Paper Magazine.)

New York, September 28, 1914.—The National Association of Waste Material Dealers at its regular quarterly meeting appointed a committee with authority to meet with a committee from the Felt Manufacturers' Association to take up the discussion of the so-called 2-cent clause in the felt makers' specifications for stock. The clause objected to is as follows:—

"Should any stock, upon receipt, appear to be packed dry and free from rubbish and out-throws, and later upon opening, prove to contain objectionable material and moisture, shipment will be sorted, the out-throws weighed and the shipper will be charged with proper deductions for moisture or out-throws, or both, freight on out-throws or moisture or both, with the cost of assorting and weighing at the rate of 2 cents per pound on actual weight of out-throws assorted and the shipper accepts such conditions as a correct charge of approximate cost of such sorting and weighing.

"Any bale found to contain inferior grade of stock upon opening, if accepted, it will be taken at the price of the lowest grade of stock found therein.

"We reserve the right to reject the whole of a shipment, if any part of same contains moisture, rubbish or any material not suitable for making paper or felt.

"All waste material and out-throws to be disposed of by us and not to be returned to the shipper."

The committee consists of Milton Birkenstein, Louis Birkenstein, and Milton Louventhal, all of Chicago, Ill.

TRADE INQUIRIES.

Recent inquiries to the Department of Trade and Commerce regarding Canadian products are:—

906. **Wood pulp.**—In view of the possible shortage of paper in Scotland, inquiry is being made for large supplies of Canadian wood-pulp, and requests are received for names of manufacturers able to make immediate shipments.

911. **Felt paper fibre.**—A London manufacturing company is open to contract for supplies of felt paper fibre, and invites samples and quotations from Canadian manufacturers able to fill orders promptly. Samples can be inspected at the Department of Trade and Commerce, Ottawa.

959. **Wood pulp.**—A Liverpool firm desires the addresses of Canadian manufacturers of wood pulp, both mechanical and sulphite.

983. **Wood pulp.**—A correspondent at Genoa, stated to be in immediate touch with paper manufacturers in Italy, reports a market there for Canadian wood-pulp in view of the suspension of German supplies and would like to hear from exporters in the Dominion.

Any manufacturer in the Dominion who wishes to avail himself such opportunities may secure particulars on application to the Department.

UNITED STATES NOTES

Special to Pulp and Paper Magazine.

It is interesting to know that the war in Europe has been beneficial to some of the American paper manufacturing companies. According to reports from Holyoke, Mass., the American Writing Paper Co. is running all its mills practically at full time. Whether this is due in some measure to anticipatory buying by customers who expect an advance in prices is not clear at this time. The company gets its sulphite from Norway for the most part and it is expected that regular shipments will not be interrupted. Its rag supplies largely come from Germany, and substitute sources of supply will have to be found.

The property of the Ballston Paper Company at Ballston Spa, N.Y., was sold last week on a mortgage foreclosure by Referee Burton D. Esmond. It was purchased by William A. Mehan for \$6,000. The mortgage was held by the American Axe and Tool company which occupied it as an axe shop before it was sold to the paper company.

H. J. Caldwell, of Carthage, N.Y., treasurer and general manager of the Champion Paper Company, in which he is a principal stockholder, is being mentioned among the republican leaders of Jefferson county as a likely candidate for member of assembly to succeed John G. Jones.

The new owners of the Anchor Paper Mills have incorporated under the laws of the State of Connecticut and adopted the corporate name of Anchor Paper Mills Company, Inc. The capital stock is \$100,000, of which \$65,000 is already subscribed for. A cash capital of \$18,000 has been paid in. The officers of the new concern are: President and treasurer, J. P. O'Brien; vice president, E. W. Broder; secretary, E. H. Richardson.

Paper manufacturers of this country are being urged to take advantage of the present crisis in Europe to establish their wares in virtually every corner of the globe where English and German firms heretofore have held the entire trade.

An exhaustive report of paper trade conditions, together with samples of paper in use in the various countries, has been issued by the bureau of domestic and foreign commerce at Washington, and is on view in the Commercial Museum, Thirty-fourth and Spruce streets, for the benefit of manufacturers.

The samples and reports cover every country in Central and South America, Africa, India, Australia and Europe, as well as the principal large islands in every ocean. These samples and reports have been gathered by the American consuls in the various countries.

American paper is said to be well thought of in most of the South American countries, but the failure of our manufacturers to push their goods has resulted in very little of it being used. Argentina is the only country that has made any progress in papermaking

and its output is only slightly in excess of \$3,000,000 yearly.

An application is in the course of preparation to be presented to Judge Ray of the United States Court at Watertown, N. Y., for a further extension of time under which Mark S. Wilder as receiver, shall operate the Remington-Martin Company, the Raymondale Paper Company and the Norwood Paper Company, the three northern New York paper and pulp mills which were petitioned in bankruptcy last May by a creditors' reorganization committee after several creditors had secured judgments and were about to levy on the assets of the three companies.

The additional thirty days to be requested will enable the creditors' reorganization committee to perfect and put into operation its plan for the readjustment of the three companies, after which it is expected the bankruptcy proceedings will be dismissed.

This makes the third extension of time granted the receiver in the operation of the mills, the other periods being for sixty days. Receiver Wilder told Judge Ray when the second extension of time was granted that the three companies were being operated at a profit, the combined pay roll approximating \$30,000 a week.

The Hartford (Conn.) Times says editorially:

"Simultaneously with the report that extra demands will be made on our paper and pulp mills because of various embarrassments, comes the assurance that both Maine and Vermont are ready with record cuts of timber and that Vermont's big crop is already on its way down the Connecticut river to the great mills at Holyoke and other points along its banks. Two years ago conditions were unfavorable both for cutting and for getting the lumber down the rivers. This year the mills are to have all of the supply of last winter and considerable that should have come two years ago.

George C. Sherman, the secretary and treasurer of the St. Regis Paper Company of Watertown, N. Y., and one of the principal stockholders of the Taggart Paper Company, has just purchased the interest of David W. Anderson in the latter concern.

A fire that caused a damage estimated at \$30,000, destroyed the second room of the Bear River Paper Company at Petoskey, Mich., and would have even smoldered the entire plant but for the work of the fire department, aided by a favorable change in the wind. The loss is covered by insurance. Two big ovens belonging to the Grand Rapids and Indiana railroad were burned, entailing an additional loss of about \$2,000. The blaze originated in the coal room in a manner not ascertained. A stream of water 8 ft. in diameter might have prevented the fire from spreading to other parts of the mill. A hundred men were thrown out of employment, as the plant will be shut down several weeks.



NEW PATENTS



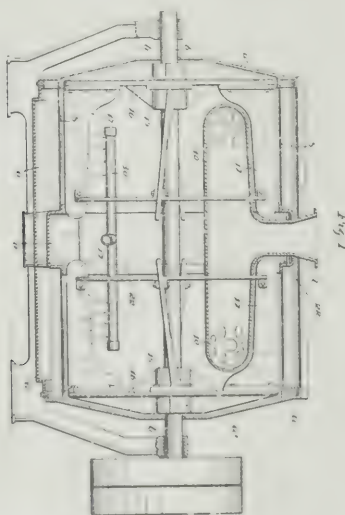
CENTRIFUGAL PULP-SCREEN.

Anton J. Haug, Nashua, New Hampshire, Patentee.
Patented Aug. 11, 1914, in United States Patent Office.
1,106,808.

The patentee says:—The object of this invention is to produce a centrifugal screen having features of novelty and advantage, of simple construction and having a high efficiency at a low operating cost.

I have illustrated my invention as embodied in a machine for screening pulp and will describe this embodiment of the invention.

Figure 1 is a side view in central vertical section of a machine embodying my invention.



Referring to the drawing, "a" denotes the machine casing, which comprises a horizontally arranged cylindrical shell a' and end plates a'' . b is a shaft supported in bearings b' b'' at each end of the casing and extending through and casing. c denotes the screen drum, which is cylindrical in form and is supported at each end from the inner walls of the end plates. The screen illustrated in the drawing and described herein is of the stationary type, though it is not essential to the operation of the device that it should be.

Arranged centrally of the length of the casing is an inlet which passes through the shell and screen drum and then branches toward each end of the machine in feed spouts 10-10, which are of course located within the screen drum and spaced therefrom. These spouts have holes near their outer ends through which the stock is delivered to the interior of the screen drum.

Mounted on the shaft within and near each end of the casing are hubs 15-15, carrying disks 16-16,

from the outer edges of which project blades 17-17, which extend between the screen drum to the feed spouts 10-10. The shaft is intended to rotate at a high rate of speed, and these blades catch the pulp as it is delivered through the openings at the ends of the feed spouts, and throw it against the screen drum with such force as to cause the fine pulp to pass through the screen against the inner wall of the casing, whence it drops to the bottom of the machine and passes out through the pulp outlet o . The blades are oppositely inclined toward the center of the machine, as illustrated, in order to give the pulp a tendency to move toward the center of the machine, with the result that the slivers and coarser particles which cannot pass through the screen travel from each end of the machine toward the center where they are delivered to the sliver outlet o' . To make sure of clearing the interior of the machine from slivers which collect at the center, I prefer either to project a circumferential ring 20 just inside of the screening drum as illustrated in Fig 3 which will cause the slivers when they strike this ring on either side to drop and pass out of the sliver outlet, or I can cut away the center of the screen, and interpose a trough 22 which will receive the slivers and carry them down to the sliver outlet at the lower part of the machine, as illustrated at o' in Fig. 1.

It will be seen that as the stock is fed only through the outer ends of the feed spouts it will be thrown against the outer ends of the screen drum, and then moved toward the center of the machine. The screening operation is a continuous one, and there will always be a steady current of slivers toward the center of the machine.

The screening operation is practically an instantaneous one, that is to say the screening is all done at the moment when the pulp is thrown against the screen by the blades. Such pulp as is not screened at this operation is carried along with the slivers and lost in the waste. In order to bring the machine up to the highest point of efficiency, and to prevent such waste of stock, I introduce a shower pipe 30 inside of the blades, preferably near the lower part of the machine, this pipe being pierced at intervals along the side to project the water toward the screen.

The water is picked up by the blades and thrown against the inner surface of the screen in the form of a spray, which beats upon the stock which is moving toward the center of the machine, washing through the screen any good stock which is being carried along with the slivers. With the use of a comparatively small amount of water the efficiency of the screening operation can be very materially increased without materially increasing the amount of water in the stock.

The machine made in accordance with my invention is simple in its construction, has a large capacity, is extremely efficient in its screening operation and easily handled and controlled. The inclination of the blades may be varied for stock of different densities, that is to say if a heavy stock with a small amount of water in it is to be screened, the inclination of the blades can be reduced, giving such stock as is not screened at the first impact a longer time to travel

across the face of the screen, during which it is subjected to the action of the spray from the shower pipe, while a thinner stock which will screen more creased. Also, if desired, the feed spouts can be shortened up to deliver the stock near the center of the machine, and the blades can be inclined in directions opposite to those illustrated in the drawings, forcing the slivers toward the ends of the machine, where they can be collected and removed through two separate outlets. This is merely a variation of which a machine made in accordance with my invention is susceptible.

RECLAIMING WASTE PRODUCTS IN THE MANUFACTURE OF SULPHITE FIBRE.

HUGH K. MOORE and ROBERT B. WOLF, Berlin, N. H., Patentees—Patented in U.S. Patent Office Sept. 15, 1914.

In describing their invention, the inventors say:—

This invention has relation to the reclamation of waste products in the manufacture of sulphite fibre and more particularly to the recovery of the sulphur dioxide, which, heretofore in actual practice, has escaped

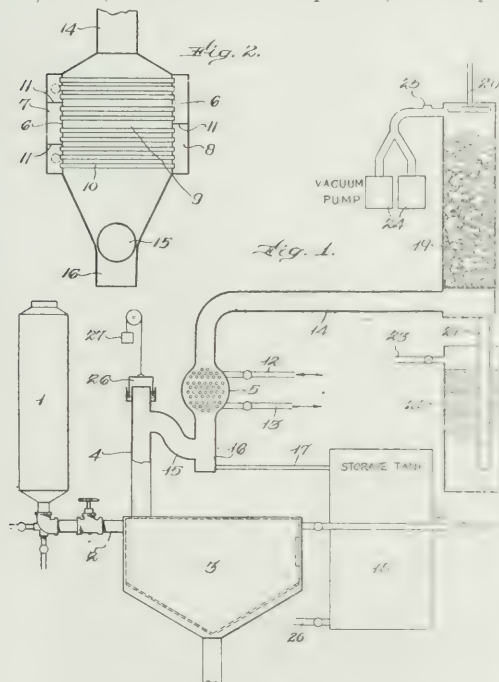
In order to prevent the loss of sulphur dioxide, it is desirable that the products of condensation should be kept as near the boiling point as possible to prevent the absorption thereby of the sulphur dioxide. Further, to secure a greater strength of acid solution in the absorber, it is necessary to eliminate the presence of air in the apparatus during the "blow." We accomplish these results by means which will be subsequently described herein.

On the drawing, in Figure 1 an apparatus is conventionally shown for carrying out our invention. Fig. 2 shows a section through the condenser.

The digester is illustrated at 1 and is of the type used in the manufacture of sulphite fibre. In it are placed the chips and the acid (calcium bisulphite and more or less free sulphurous acid), and, after the neck is sealed, steam is injected into the digester to bring the contents thereof to the proper temperature. If desired, sulphur dioxide may be injected into the digester in accordance with our application Serial No. 541,246, filed February 1, 1910. After the wood has been cooked at the proper temperature for the proper length of time and the cellulose fibres have been freed from their cementing materials, the contents of the digester are blown in the usual way through the pipe 2 into a blow pit conventionally illustrated at 3, which is constructed with the usual false bottom for permitting the escape of the waste liquors. As usual, the interior of the blow pits is at slightly less atmospheric pressure. Hence, when the contents of the digester of ordinary size are discharged into the blow pit at a steam pressure of say 45 to 75 pounds per square inch (not including the pressure due to the static head), from 18,000 to 20,000 pounds of steam are liberated in the blow pit from the discharged water. The temperature of the contents of the digester varies from 250 deg. F. to 320 deg. F., and, as soon as the materials reach the blow pit, vapors arise therefrom and are conducted away through a vomit stack.

Heretofore, in actual practice, these stacks have always opened into the atmosphere into which the rising vapors escape and become dissipated. In addition to the vapors, there has been an escape of a certain amount of free sulphur dioxide, which was not utilized in the cooking operation. The escape of this free sulphur dioxide is a serious menace to vegetation and is highly objectionable on account of the odor.

In accordance with our process, the vomit stack is closed to the atmosphere during the blow, and the vapors and gases are conducted to a surface condenser, conventionally illustrated in Fig. 1 at 5. This surface condenser may be of any suitable or desired type. Preferably, as shown in Fig. 2, it is of the horizontal type and is provided with diaphragms, 6, 6 forming compartments 7, 8 and 9, the compartments 7 and 8 communicating through tubes 10 passed through the chamber 9. Partitions 11 divide the chambers 7 and 8 as shown, so that the cooling medium takes a sinuous path through the condenser. As shown in Fig. 1, the vomit stack discharges into the lower extension of compartment 9 through conduit 15, and the gases and vapors are caused to circulate upwardly and around the tubes. Cold water or any other suitable cooling medium is injected through the pipe 12 to the chamber 7, and passing through the tubes is discharged through the circulating pipe 13. The vapors entering the condenser from the vomit stack are condensed and pass from the trap 16 through a pipe 17 to a receptacle 18 from which they may be drawn by the valved discharge pipe 26. Ordinarily we employ water as the cooling medium at its seasonable tempera-



from the blow pit after the cooked charge has been delivered thereto from the digester.

In our previous application Serial No. 590,158 filed November 1, 1910, we have illustrated conventionally an apparatus for and described a process of recovering sulphur dioxide by bringing the vapors from the blow pit into contact with the chilled surfaces of a surface condenser, and condensing them, and then separating the sulphur dioxide from the other gases by absorption in a suitable absorber.

any difference in lieu thereof some other chilled cooling medium may be utilized, or the water itself may be cooled prior to its admission to the condenser.

The effect of condensation of the vapors is to reduce to liquid form the water vapor and such compounds as wood alcohol, benzaldehyde, acetone, acetic acid, and other vapors which would condense at or slightly above the temperature of the cooling medium, the quantities, amounts and character of these compounds depending more or less upon the methods, temperature, etc., used in cooking as well as the nature of the materials cooked. The application of the principle of recovering these compounds by condensing vapors arising from the blow pit, while herein described as applying to the sulphite process, may be applied to any other process in which free gases are discharged.

The condensation of the water vapor to water permits the absorption by the condensed water of only a relatively small proportion of the free sulphur dioxide gas which escapes with the vapor, and consequently the great portion of free sulphur dioxide which is uncondensed passes through the condenser and is conducted away therefrom by means of the pipe 14 to an absorbing apparatus, which is illustrated as comprising a tower 19 containing limestone. In the upper end of the tower is shown a sprinkler head 20 through which water is sprinkled into the tower. In the passage of the sulphur dioxide through the tower, it reacts with the lime and is finally discharged through the pipe 21 as a solution of calcium bisulphite and free sulphurous acid. The effluent from the tower is collected in a tank 22 from which it may be drawn by a valved pipe 23. A vacuum pump 24 is connected to the upper end of the tower. In the conduit leading to the vacuum pump, I have indicated a regulator check valve 25 of any suitable construction, which will open when the vacuum is too great to avoid damage to the blow pit.

The product of condensation, which is collected in the tank 14 or the tank 18 as the case may be, may be neutralized with lime. This has the effect of precipitating the sulphur dioxide in the form of calcium monosulphide (CaSO_3) which is removed by passing the materials through a filter press, leaving the filtrate practically clear and neutral. The filtrate contains acetic acid in the form of a lime or other salt, methyl alcohol, benzaldehyde, acetone and other organic acid salts and compounds which may be separated and removed by any well known process, such as evaporation, fractional distillation and precipitation by various reagents. The contents of the tank 22 may be used in the digesters in cooking the wood.

The vomit stack 4 at a suitable point has a luted cover 26 partially balanced by a weight 27 so that the stack may be opened to the atmosphere. Immediately prior to the blow, steam is injected into the pit 3 through a valved steam pipe 28 for the purpose of completely filling the pit and the stack with steam and thereby forcing therefrom any air which is contained therein. Then the cover or cap 26 is closed, the supply of steam through the pipe 28 is cut off, the vacuum pump 24 is started, and then the contents of the digester are discharged into the blow pit. The steam in the blow pit, prior to the admission of the contents of the digester, rapidly condenses and there is substantially no pressure above atmospheric pressure in the blow pit. The rising vapors pass from the vomit stack through the conduit 16 into the condenser 5 and are condensed as explained.

We have stated that a small proportion of sulphur dioxide is absorbed by the water of condensation in

the condenser. Preferably, therefore, the water of condensation is maintained at a temperature but slightly less than the boiling point so as to limit the absorption thereby of the free sulphur dioxide. But utilizing the horizontal surface condensing the vapors from the blow pit, the only water which can absorb the sulphur dioxide is that which has been condensed from the steam coming from the blow pit, and the water being brought out near the boiling point, it contains a minimum amount of gas. Consequently the greater volume of free gas will not be absorbed by the water but will pass on to the absorbing tank or tower. Furthermore, by the employment of a surface condenser, the water, which is used as the cooling medium and which is delivered from the condenser, is in a clean heated condition and may be utilized for a variety of purposes for which it could not be used if it had been previously employed in the direct condensation of the vapors by contact therewith, because in the latter case, it would have absorbed a portion of the sulphur dioxide and other products from the blow pit.

In the form of condenser shown, the products of condensation dropping from the tubes are met by the incoming vapors and are heated thereby nearly to the boiling point so as to effect the liberation of sulphur dioxide absorbed thereby.

We have herein stated that we may treat the product of condensation in the tank 18 with lime to reclaim the sulphur dioxide absorbed therein. On the other hand, however, we may first subject the product of condensation to a vacuum for the purpose of liberating the sulphur dioxide which may be condensed or absorbed in any suitable manner. The remaining product of condensation, which contains acetic acid, may be recovered as previously indicated.

We have herein stated that, prior to the blow, the pit and vomit stack are swept clean of air by the injection of steam. This is a feature of great advantage as it relieves the vacuum pumps of the necessity of exhausting the air from the pit and stack, and makes it possible to use a smaller vacuum pump than would otherwise be necessary on account of the presence of inert gases. Further, by eliminating the inert gases, a smaller absorption apparatus may be used. Because of the absence of air, a commercial or usable acid may be made in the absorption apparatus, since the effects of partial pressures are obviated. Furthermore, owing to the absence of air, an acid solution is obtained in which the portion of free sulphurous acid is greatly increased, and, in addition, there is no oxidation of the sulphur dioxide to trioxide.

PULP ENOUGH TO SUPPLY THE WORLD—Now is the time to secure your supply of pulp for the next ten years and avoid the possibilities of higher prices. Inquiries invited. Address, F. E. R., 404 King's Hall Building, Montreal, Que.

OWN YOUR OWN PULP AND TIMBER LIMITS.

Buy now on easy terms before the prices double. Full particulars on application to, Pulp and Timber, care Pulp and Paper Magazine, Montreal, Que.

WANTED.

Three to five thousand acres of wild land suitable for game preserve. Tract should contain one or more lakes and streams, good hunting and fishing. Must be fairly accessible. Address, giving full particulars, J. G. Dorance, 532 N. Howard St., Baltimore, Maryland.

PULP AND PAPER NEWS

Fred. L. Radcliff of the Ratcliff Paper Company Toronto, who is a member of the Militia Committee of the National Council of the Y. M. C. A. has returned after spending a few days in the camp at Valcartier. He reports that the volunteers greatly appreciate the facilities which have been placed at their disposal by the Y. M. C. A. in furnishing stationery. A large quantity of which is now on hand. The paper firms and jobbers have been very generous in their donations. Thirty thousand sheets of note paper and twenty five thousand envelopes are used each day.

The paper box industry is one that is benefitting by the war and firms, which are now producing made-in-Canada articles that were manufactured in Germany before the outbreak of hostilities, are giving orders for many kinds of receptacles. The Rudd Paper Box Company, Toronto have recently increased their staff by about twenty per cent and in some departments are working overtime on certain nights of the week. Other firms also report a good outlook.

Thomas Gain, sales manager of the Don Valley Paper Mills, Toronto, has returned from an extended trip to Montreal, Ottawa and Montreal and reports that business is very good. Mr. Gain has fully recovered from his recent illness and is now at his new office on the seventh floor of the new Dominion Bank building every day.

B. Biermans, president of the Belgo-Canadian Pulp and Paper Company, Shawinigan Falls, Que., has returned from spending several months in Europe. He was in Brussels when the Germans entered the Capital and on Sept. 10th he and his wife while motoring to the Coast to catch a vessel for Canada passed through the devastated city of Louvain, where the Germans wrought such destruction. He relates some gruesome tales of the terrible atrocities committed by the German army and says that numerous scenes he witnessed were pitiable in the extreme.

Duncan Chisholm of Chisholm Corporations, Ltd., Toronto who will erect a pulp and paper mill at Smooth Rock Falls on the Metagami River is at present abroad and is not expected home for several weeks. L. Gray has been up north with a party of engineers for several weeks, examining the site and taking measurements for the company, has returned and is at present in Milwaukee. It is understood that nothing definite will be done until the return of Mr. Chisholm. It is learned that the pulp mill will have an output of about one hundred tons per day and will be erected first, to be followed later by a paper mill of about one hundred and fifty tons daily production of news print.

H. F. Young, who is on the travelling staff of Copp, Clark Company, publishers, Toronto, was in Europe in the interest of the firm at the time the war broke out. While in Nuremberg, he was taken as a prisoner of war by the Kaiser's army along with several other British subjects who will be held as exchanges for German prisoners. Mr. Young has been given some light work about the camp and has been allowed to buy luxuries that are not provided in the ordinary camp fare.

F. H. Gage, former sales manager of the Kinleith Paper Mills, and family who have been spending some time in the Old Country have returned to Toronto. Mr. Gage is now selling representative for several special lines of paper.

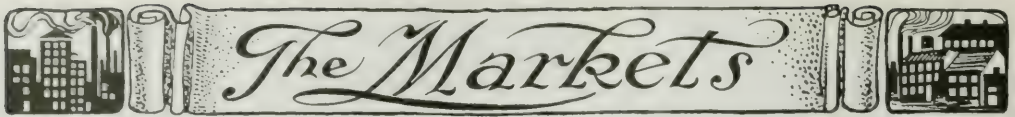
C. A. Henderson, who represents Charles Morgan and Company, London, England, was in Toronto and Montreal this week on business? Many of the large paper firms in England are going to send their travellers to Canada during the coming season and although prices have been raised somewhat owing to war insurance, increased freight rates etc., jobbers, who have been handling English tissues, parchments, heavy ledger and other lines, expect to receive their full consignments.

The financial year of the Spanish River Pulp and Paper Mills closed on June 30 and the annual meeting will be held in the near future. Thomas Gibson, of Toronto, secretary of the company who recently returned from a trip to New York, states that the due has not been fixed yet. John G. Sutherland, sales manager of the company, who has been spending a few days in Toronto previous to returning to his headquarters at Dayton, Ohio, reports that all the plants are operating to their utmost capacity.

The Ontario Workmen's Compensation Act, will come into operation on January 1st next, and the making of the system has been completed by F. W. Hinsdale, the expert from Washington. The composition of the board is now complete, being Samuel Price, chairman, A. A. Wright, Toronto, vice-chairman and George A. Kingstone, Toronto. Several meetings have been held and over eighteen thousand manufacturing firms in Ontario will come under the jurisdiction of the Act. Circulars have been sent to all these firms requiring information as to the number of men employed, amount of pay rolls, etc., and as soon as this data is at hand the rate for each particular hazard will be struck and the assessments ordered. Some important points have yet to be decided by the Board so that no discrimination will be imposed on any firm.

The Hinde and Danche Paper Company, Toronto, report that the market for corrugated paper boxes is very good at the present time and that the demand from canners and other concerns is improving. The company are going very extensively into corrugated containers for shipping bread and so far this year have sold over fifty thousand.

Shipments of timber from Northern Europe and the Baltic Sea having been cut off, owing to the war, the British demand for Canadian lumber has increased considerably during the past few weeks. The practical assurance that supplies will be less than requirements has resulted in all round advance in prices. Shippers have in many cases succeeded in cancelling earlier contracts, which will now be put on the market at a considerably advanced figure. Quotations are now higher than those ruling before the outbreak of hostilities. As a result Canadian exporters of lumber to have a profitable season thereby recouping themselves for the low prices at which shipments have been made earlier in the year.



The Markets

CANADIAN MARKETS

Four branches of the pulp and paper trade, if not more have been distinctly improved by the war and these are the news print ground wood sulphite pulp, kraft pulp and kraft papers. What the effect will be on the other lines cannot be declared with any degree of certainty at the present time. All news print mills are running to capacity and, while the number of foreign inquiries have materially dropped off, and the panicky feeling that at first existed has calmed down somewhat, there is not a plant which could not sell much more than its output. One feature that has developed is that many users are calling for double the storing it whenever they have facilities to do so, and are paying for the deliveries at the time they are made.

Ground wood continues stiff in price and any surplus the mills have, after supplying contracts, they are able to command a good figure for it. Sulphite also remains very firm. Many contracts for news print expire in a couple of months, and it is probable if, at that time, there is no sign of the cessation of the European strife, publishers will have to pay from one-quarter to half a cent more. The exporting mills have all the business that they can possibly attend to, and are naturally marketing their product at the highest possible figure. Owing to the German kraft mills having closed down kraft has taken a big boom in Canada. Kraft pulp has also taken a decided jump.

Book and writing mills are not rushed and, although American manufacturers have raised their prices from five to ten per cent according to the quality of the paper, there has been only one mill in Canada so far that has increased its figures, the advance varying from half a cent to a cent. The others have raised in certain grades only, although all withdrew their quotations several weeks ago. There will be no general raise until present contracts for sulphite and other supplies expire, which will be by the end of the year. Then if raw material holds its present high values, there will be a corresponding augmentation in quotations for the finished products. Several lines of crepe tissue and decorative papers have been advanced by Canadian mills about five per cent, and book and writing mills will, under no circumstances, take orders at present prices and deliver at future dates, but insist that all orders have to be filled and shipped at once. They are taking no chances. Envelopes made from imported English papers have been elevated by the manufacturers by about ten per cent, but this output is not very large, and so far, envelope makers are producing their regular lines at former prices. In all papers where finish color is required, ascendant prices are asked and the mills are cutting out colored papers as much as possible.

Paper bag discounts have been reduced from two and a half to five per cent, and the ten per cent, which was formerly given by some plants, on wrapping papers in our line, has also been taken off. Jobbers report that a good business has been done in their various lines during the past month and some are proud of the corresponding period of last year. English mills who have been sending certain makes of pa-

per to Canada will, in many instances, continue shipping, although at a higher figure. There has been an advance in practically all classes of rags and paper stock and in roofing stock there is a disposition on the part of certain dealers to hang on to supplies in order to realize the highest figure. Rope bags are in good demand, and certain lines of jute paper are also in much requisition.

Market conditions are, however, settling down to a more normal state, and there is a feeling that things will right themselves providing the war is not too prolonged. Purchasing in most lines is only from hand to mouth and all business, financial, and other institutions are buying only as required. The printing trade is not in as bad a condition as might be expected, as out of the twelve hundred printers in Toronto only about fifty are unemployed, according to the canvass made by the local typographical union. As many order forms, blanks and other printed matter are not being used, however, by manufacturing firms, while insurance companies, banks, etc., are employing cheaper grades of paper in their printed matter. The paper box industry is picking up as a great quantity of package goods are being made for the holidays, and these will replace foreign importations. Several mills are experimenting with certain kinds of papers heretofore imported, and will soon make some interesting announcements, it is expected.

Quotations f.o.b. Toronto are:

Paper.

News (rolls), \$2.00 to \$2.10 at mill, in carload lots.
News (sheets), \$2.10 to \$2.20 at mill, in carload lots.
News (sheet), \$2.25 to \$2.65, depending on quantity.
Book papers (cartoads), No. 3, 3.00c. to 4.25c.
Book papers (ton lots), No. 3, 4c. to 5.50c.
Book papers (cartoads), No. 2, 4.25c.
Book papers (ton lots), No. 2, 4.50c. to 5.25c.
Book papers (cartoads), \$4.15 to \$5.25.
Book papers (ton lots), No. 1, 5.25c. to 6.00c.
Writings, 5c to 8c.
Sulphite bond, 64c. to 74c.
Grey Browns, \$2.35 to \$2.75.
Fibre, \$3.25 to \$4.00.
Manila, B., \$2.85 to \$3.25.
Manila, No. 2, \$3.10 to \$3.50.
Manila, No. 1, \$3.35 to \$4.00.
Englazed Kraft, \$3.75 to \$4.50.
Glazed Kraft, \$3.75 to \$5.00.

Pulp.

Ground wood (at mills), \$16 to \$18.
Ground wood, \$22 to \$25 delivered.
Sulphite (unbleached), \$18 to \$50, delivered in Canada.
Sulphite (unbleached), \$50 up, delivered in United States.
Sulphite (bleached), \$58 to \$59.
Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings \$1.95, f.o.b. Toronto.

No. 1 soft white shavings, \$1.85.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.05.
 Heavy ledger stock, \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 85c.
 No. 1 Manilla envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c to 47½c.
 Over issues, 55c.
 No. 1 clean mixed paper, 40c.
 Old white cotton, \$2.50 to \$2.75.
 Third sand blues, \$1.60.
 No. 1 white shirt cuttings, \$6.00.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$5.25.
 Ordinary satinets, 90c.
 Flock, \$1.00.
 Tailor Rags, 80c.

Quotations f.o.b. Montreal are:—

Book and News Paper.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5½c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manilla, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

I. D. Bradshaw, of Bradshaw's Limited, manufacturers of walled papers. Toronto, is in Winnipeg and other points west on a business trip.

NEW YORK MARKETS

During the interval mills have drawn freely on ground wood supplies on contract and a number of spot orders have been received in the local market at current quotations, \$17.50 to \$18.25 f.o.b. ground wood mill. An announcement was made that a certain pulp mill would like to enter a ten-year contract for a large quantity of ground wood at \$15. f.o.b. mill. With an average 15 cent freight rate the value in New York would be about \$18.40, which is considered too high a price under present conditions.

The sulphite situation is easier than at any time since the outbreak of the European war. Business has been rather quiet. Some pulp arrived at domestic ports from Scandinavia and Rotterdam, but this was for immediate shipment on contract.

The domestic rag market maintained a quiet but firm tone. Exports of rags and paper stock were very small as domestic mills drew on all accumulation early in August. Bagging has been scarce and prices have shown a higher range than for some time. Old genny was quoted at 134, f.o.b., New York. The demand for old rope has been active at 3½ to 4½ cents a pound, the highest value in a number of years.

Old waste papers have been in fair demand, and prices have been very firm. Soft shavings have been as high as 2.25 as again 1.80 before the outbreak of the war. All grades of flat stock have moved actively on contract, as book mills have been rather short of some grades of pulp that are used for strengthening. Mixed papers have been quiet, but values are firm at 40c to 45c a hundred.

Ground Wood, No. 1, \$20 to \$24, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2½ to 2¼ f.o.b. mill.
 Unbleached Sulphite, impt., 2.25 to 2.45, ex dock, New York.

Bleached Sulphite, domestic, 3c to 3.35c.
 Bleached Sulphite, impt., 3.00 to 3.55, ex dock, New York.
 Easy Bleaching, impt., 2.75, ex dock, New York.
 Unbleached sulphite, impt., 2.25 to 2.35, ex dock, New York.
 Bleached sulphite, impt., 2.80c to 3.00c, ex dock, New York.

Kraft Pulp, 2.20 to 2.30 ex dock, New York.

Paper mills reported in the local market that their output during the month of August was about normal. Most business was done by small orders for meeting the immediate demands on jobbers. The tendency is to hold out for small business for immediate delivery. Writing papers were advanced 5 per cent on grades under 10 in value and 10 per cent on grades up to 15 cents in value by one of the largest manufacturers. Envelope prices were also advanced about 10 per cent by one of the large manufacturers. Reports from newspaper manufacturers show that business has suffered a more rational tone and the feeling is that few publishers will draw ahead of their contract quantities. Business had been so tight before the war that the heavy extra editions of metropolitan dailies have only made up for losses earlier in the year. As this is the busy time for wall paper printers there has been an active drawing on hanging supplies. Prices have been firm and manufacturers feel satisfied with the business of this year. There is a fair demand for sheet paper at 2.25 to 2.50 New York, which is about 10 to 15 per cent above the price quoted before the war. Sheet runs are in good demand with no available supplies. Wrapping

paper mills reported a 20 per cent increase in their output for August as against the output during the same period last year. Prices are firm at an advance of from $\frac{1}{4}$ to $\frac{1}{2}$ cent a pound in all grades. Some book mills have advanced the price in some of the very high grades, and others on some of the low grades. Most of them, however, reported that business has not warranted any advance as yet but orders for immediate delivery only will be taken. All prices have been withdrawn and quotations that will be made on application are subject to change without notice. Specialty houses have followed the same policy, although sharp advances have been reported in some of the colored cover papers. The tissue market showed advances from 40c a ream before the war began to 47 $\frac{1}{2}$ c. There is a poor demand at this price, however. Cigarette papers have been very scarce, and a strong demand has come into the market from large cigarette manufacturers, but domestic mills have not been able to take much of the business as they are now three or four months behind in deliveries. Prices on paper bags were advanced 10 per cent under a good demand. The board business reflected a more active and firmer tone.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side, runs, 2.25.
 News, sheets, 2.35, .o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13 $\frac{3}{4}$ c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4 $\frac{1}{2}$ c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manila jute, 5 $\frac{1}{4}$ c to 5 $\frac{1}{2}$ c, delivered.
 Manila wood, 2.75 to 3.25, delivered.
 Kraft No. 1 \$3.85 to \$4.00 f.o.b. New York.
 Kraft No. 2 \$3.35 to \$3.75 f.o.b. New York.
 Boxboards, news, \$20 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.
 Wood pulp board, \$42.50 per ton, delivered.
 Tissue, wick cylinder, 47 $\frac{1}{2}$ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

PAPER MILL GENEROUS.

The United States residents of the St. Catharines Anties have united in an American society, partly for the purpose of showing sympathy and giving aid to the British in the present war. The first subscription of \$500 was from the Ontario Paper Company of Thorold.

SWEDISH WOOD PULP TRADE.

According to "Affaivalden" of September 9th, the situation in the mechanical pulp is as follows:

Shipments from the Baltic are now in full swing, but such deliveries are mostly on account of old contracts. On account of the drought and the water-famine there would have been very little unsold in Sweden at the present time, but as France has cancelled a few parcels, these have been available for other markets. No new sales of mechanical pulp have been reported from Sweden and we are also informed that the same can be said about Norway, where the deliveries on old contracts are very heavy.

In the chemical pulps, strong sulphite has been in very strong demand and about 20,000 tons have been sold for prompt delivery during the last 8-10 days. Prices are still rising and as much as £9, clear net f. o. b. Baltic ports extra cash, all commission and discount deducted has been paid for large parcels.

Sulphate is also rising and Kr. 145.—clear net f.o.b. cash payment has been paid for prompt delivery.

BIG SHIPMENT OF WOOD PULP.

The steamer Isthmian, recently cleared, from Seattle is taking as part of her cargo to New York 500 tons of spruce wood pulp from British Columbia. This is the first pulp shipment from British Columbia to the Atlantic coast, and is expected to be the forerunner of many more.

NORWAY WARNS BRITISH PAPER MAKERS.

"Forward," the trade journal of Norway, says, September 12th: "Both branches of the pulp trade are at present quiet. The cellulose section is, however, very strong and prospects are considered very good."

As regards mechanical wood pulp we beg to repeat for the Norwegian mills during the war.

our warning to British paper makers not to allow themselves to be persuaded that there will be no difficulties ahead.

CLEARING UP WOOD PULP CASES.

The Board of United States General Appraisers is clearing up the work of making refunds on importations of wood pulp and paper from Europe upon which duty was paid under protest, the Customs Court later ruling that the free entry of Canadian wood pulp and paper under the reciprocity clause was violative of the favored nation clause of our treaties with other countries. There were about 8,000 of these cases before the Board, involving the return of approximately \$3,000,000, and the Board is endeavoring to dispose of the protests before taking up work on cases arising from the new tariff law.

ADDITIONAL WANT ADVTS.

WANTED Foreman for portable or semi-portable dressing plant in woods. State age, experience, salary expected, etc. Box 91, Pulp and Paper Magazine, Montreal.

WANTED Night foreman for mechanical ground wood mill state experience, references and other particulars. Address "Employer" care Pulp and Paper Magazine, Montreal.

Pulp and Paper Magazine

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No. 20

PROSPERITY SOON.

There will be sore trial yet in Canada through the war. There will be sad gaps in the ranks of our contingents; some industries will be interrupted, and some will be lost. But on the whole, the outlook is bright. When the war came we had passed through a stage of financial hardship, which made the shock more easy to bear, as compared with what it might have been. Had the upheaval found Canada in the midst of the over-development, which was noticeable three or four years ago, there might have been disaster. But we are standing the present troubles well. And after the war, immigration must not only resume, but go rapidly forward. Industries will be favored with markets and capital as never before. After a few more months of trial we should notice the first beams of a new day of prosperity in our land.

HYDROGRAPHIC PROBLEMS.

The present abnormally low water conditions in the Eastern States and on many Canadian rivers gives rise to speculation as to what may happen in times to come when the situation with respect to those powers which are already developed becomes more acute. This it is almost certain to do. While there are no accurate measurements to support the claim, still theory, the experience of other countries, notably the United States, and the observation of engineers in Canada all point directly to the conclusion that the removal of forest cover has interfered with the flow of the streams on which the pulp manufacturer is dependent for his power. And the forest cover is likely to suffer the ravages of fire a great many years yet, unless the temper of the Canadian people and the attitude of the governments changes very quickly.

Already those who are familiar with forest cover conditions on the Ottawa and St. Maurice, our two

chief power streams outside of Niagara, say that the forest fires have undoubtedly made a rapid run-off of water most easy, and that every season these rivers run greater danger of drought and flood conditions, unless some remedial measures are taken. Chaudiere Falls, which used to have a fairly regular flow is showing signs this year of disappearing, and one of the largest producers of pulp and paper in Canada, according to press reports, is facing a pulp shortage because of the lack of power.

If, as it appears, the Canadian public can not see its way clear at the present to spend the money on forest fire protection, then there must be found the funds for an increased number of improvements of a structural nature.

Even at Ottawa city today would not be nearly so

Already the Dominion Government has done well in its work on the Upper Ottawa. The power string serious as it is, had there not been an unfortunate accident in the dam below Lake Temiskaming. The Upper St. Maurice storage scheme bids fair to help out the power developments at La Tuque, Grand Mere and Shawinigan Falls.

The crux of the power question is whether or not the head can be maintained. It is true that there are other important points, such as the distance over which the transformed power has to be transmitted, but that feature to which backers of power developments look to most of all is the minimum head. No chain is stronger than its weakest link, and, generally speaking, no power house is more efficient than its lowest water levels.

There have been stern foreign critics of Canadians' claims to immense power resources. One of these, the French engineer Robert Pitaval, said, after visiting a large number of Canadian plants: "Everything opposes the creation of extensive plants, for instance, the rigor of a long and terribly cold winter and the lack of enthusiasm of capitalists for these en-

terprises, in spite of the encouragement of the Government." After indicating his belief that there will be no further development at Niagara Falls because of an understanding on the part of the United States and Canadian governments, he says: "It seems that Canada cannot be considered a serious danger to the other countries blessed with water-falls. Is not the proof in the failure of electro-chemical and metallurgical industries, which have all the means possible to succeed in Canada."

While Germany has developed 31.2 per cent of its available power, Switzerland 25 per cent and the United States 15 per cent, Ontario has developed 14. per cent, and Quebec 5.7 per cent. The Canadian statistics are derived from a report of the Commission of Conservation in September, 1911. They do not take into consideration, therefore, the most recent developments, such as those on the St. Maurice.

Even Norway and Sweden, which countries are supposed to take a very high stand in electrical works, are below Ontario, with 12.3 per cent and 8.2 per cent of available powers harnessed. But Canada should be able to do far better than at present. In the minds of all who have thought of the matter the conviction that development has really not yet begun is foremost. While it may be true that numerous reasons, economic, intellectual and physical, stand in the way of an early exploitation of a large number of our water-falls, there is still another reason which may be brought out perhaps best by the fact that Germany, Norway and Sweden and Switzerland, where the best development of waterpowers is found, are the countries in which hydrographic services are oldest, and whose studies of the waterpowers are most extensive. This was brought out recently by Mr. Arthur Surveyor, in an article on the waterpowers of Canada in the "*Revue Economique Canadienne*." Mr. Surveyor argues that what is needed is increased attention to hydrographic surveys, and readings. This is because, he says, there must be placed before capitalists who might invest in power plants, a very accurate knowledge of the possibilities of the various watercourses. Just now, when new projects present so many other problems, it is hardly possible to expect large undertakings when the certain knowledge of the hydraulic possibilities does not exist.

In 1911 Ontario had 46,000 horse-power being developed for the purpose of shaping products of the forest, and Quebec 88,000 horse-power. Leaving out of consideration the great advance that has been made since that time, the two prairie provinces of the Dominion have a lead of 6,000 horse-power over the next largest nation, Sweden, which has 120,000 horse-power devoted to manufactures of wood.

We have, therefore in Canada much to be proud of, and far more to hope, and the fact that the pulp industry is such an outstanding consumer of power will be in itself a guarantee that the industry as a whole

will stand strongly behind new undertakings along lines of hydrographic measurement, statistics, and professional organization which the various Governments may propose.

The support which has already been given by pulp manufacturers and limit-holders in their private capacity to the Government works will be found indicative of the industry as a whole, and for the purpose of bringing into the fullest use the waterpowers of our land, the members of the pulp and paper industry will do everything in their power.

Forest protection, storage schemes and hydrographic surveying three of the most important works that can be undertaken by our Governments at the present time, will find warm advocates among pulp and paper manufacturers.

THE USE OF PYRITES.

The placing of sulphur upon the list of articles that are contraband of war has placed Scandinavian chemical pulp producers in a peculiar position. The lack of sulphur has seriously impeded the industry in the past few weeks, and it would not be remarkable if an unsettled state of affairs in the naval situation in the North Sea and the Baltic gave Scandinavian sulphite manufacturers a great set back.

This brings up the question of alternative means of producing sulphurous acid in some other way than by burning pure sulphur. A Canadian writer, Alfred G. Wilson, in his report on "The Pyrites of Canada," claims that there can be effected a saving of \$11.35 per hundred kilos of sulphur. Pyrites containing 45 per cent of sulphur can be utilized quite easily, and even those pyrites which have 35 per cent can be used, if, according to the new process of Buddeus there is also 0.8 per cent to 1 per cent of copper also contained in the residue after the burning. The process can be used on small quantities of material, and intermittently. The cost of treating is said to be very low, from \$2 to \$3 a ton. There are many pulp mills in Europe using the process.

There has recently been advanced a proposal which would seem to make the pyrite process still more valuable. It is that out of the ores there may be extracted by simple washing sufficient copper and sulphur to make the operation very profitable, even when there is only 0.30 to 0.5 per cent of copper. The iron residues are more useful when these two have been taken away, and can be sold to advantage. The copper, which is extracted as a sulphate can be obtained from the washing water by the addition of old iron, which causes the copper to be precipitated as a fine red powder, which is usually about 90 per cent to 92 per cent pure. The sulphate of iron solution obtained may be used in the manufacture of dark colored papers, or sold crystallized as sulphate of iron. Even as an aid to the production of clean grain through its antiseptic qualities, it is of value.

EFFECTS OF VARYING CERTAIN COOKING CONDITIONS IN PRODUCING SODA PULP FROM ASPEN¹

By HENRY E. SURFACE, Engineer in Forest Products, Forest Products Laboratory, U.S. Dept. Agriculture.

(Concluded from October 1st issue. — Reference Notes on Page 604.)

The apparatus employed in cooking is shown in Fig. 1. Fig. 2 shows diagrammatically the course of the material through the various stages of treatment and testing, and in this way the relation of one part of the procedure to another is made clear.

After the amount of moisture in the chips had been ascertained by means of sample A, the charge was weighed out and put into the digester. Caustic soda solution, of the desired concentration and volume, had been prepared by diluting the necessary quantity of analyzed stock solution (sample B) with water. It was then heated to the charging temperature and run into the digester, and the cooking operation was begun by permitting live steam to enter at the bottom.

During the cooking, observations were made at 15-minute intervals of (1) digester temperature, (2) digester pressure, (3) steam pressure at digester inlet, and (4) room temperature. The volume of liquor in the digester was also observed, but at hourly intervals. These observations were recorded, and a graphic "log of cook" was made at the same time, an example of which is shown in Fig. 3. If at any time the digester temperatures and pressures as observed on the thermometer and pressure gauge did not agree

During the first hour of cooking the digester pressure and temperature were brought, at a uniform rate, up to the maximum to be employed, and were held constant at this value during the remainder of the cook. At the end of the cooking period the top relief vent was opened and the digester pressure quickly "relieved" until "blowing pressure" was reached, when the vent was closed, the two blow-off valves were opened, and the digester was emptied under blowing pressure with the assistance of a steam ejector in the blow-off line.

The pulp was caught in the blow pit, where it was washed with three or more 50-gallon applications of hot water. After the blowing and after each successive washing the pulp was allowed to drain, and the drainings were pumped to the black-liquor storage tank. The washing operations were continued

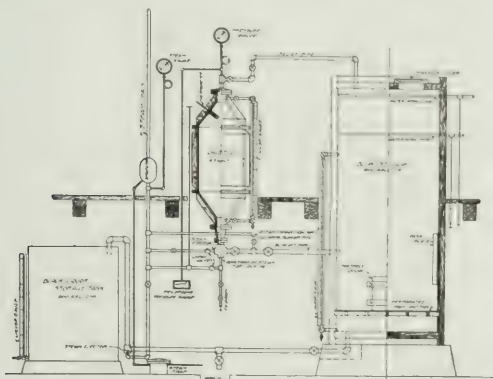


Fig. 1.—Experimental equipment for cooking by the soda process.

when compared by means of pressure-temperature tables for saturated steam, the excess of pressure was relieved; such a condition occurred as a rule only during the first hour of cooking. The room temperature and the pressure of steam at digester inlet were kept as near constant as possible for all the tests, so that all conditions affecting condensation, aside from the cooking itself, would be uniform. For the same reason, steam of approximately the same moisture content was used in all tests.

¹This paper presents detailed information of value in experimental work in the laboratory and in promoting the efficiency of commercial paper-making plants employing the soda process.

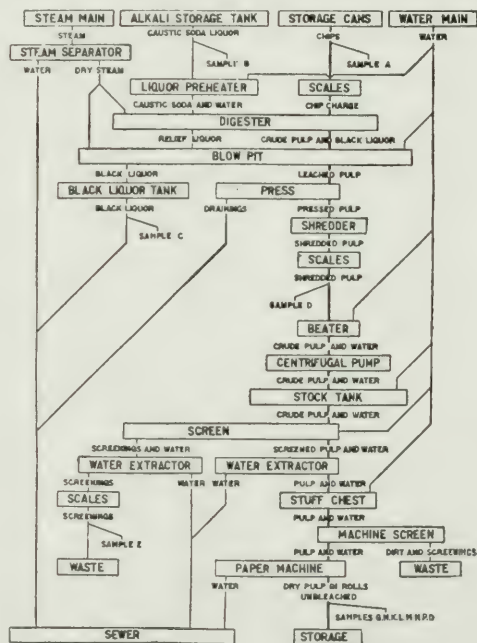


Fig. 2.—Flow sheet, showing course of material through the various stages of treatment and testing.

until the last drainings were of a specific gravity lower than 1.003 at 22 deg. C. Inasmuch as the top relief pipe emptied into the blow pit, it was possible to collect the small amount of relief liquors, together with the black liquors, in the storage tank, where the volume of the whole was read off on the graduated tank gauge. A sample of this (sample C) was secured

for analysis, and the amount and character of the recovered chemicals determined (Fig. 2).

After the last washing the crude pulp in the blow pit was drained as dry as possible and, by means of scoops, removed to a strong linen bag inclosed in a perforated metal cylinder. The pulp in this form was then placed under a 70-ton, knuckle-joint, power press. After being pressed to about 30 per cent bone dry the pulp was next "opened up" in a swing-hammer shredder running at low speed and without a cage, so that the largest lumps after shedding were about hazelnut size. This was done to facilitate sampling and increase the accuracy of the dry-weight determinations. The shredded pulp was weighed and sampled (sample D) for determining the dry weight. It was then mixed with water and further opened up in a 25-pound Hollander-style beater, with the roll well off the bedplate so that no real beating could take place, and was pumped from the beater to a 200-gallon stock tank at the head of the screening system.

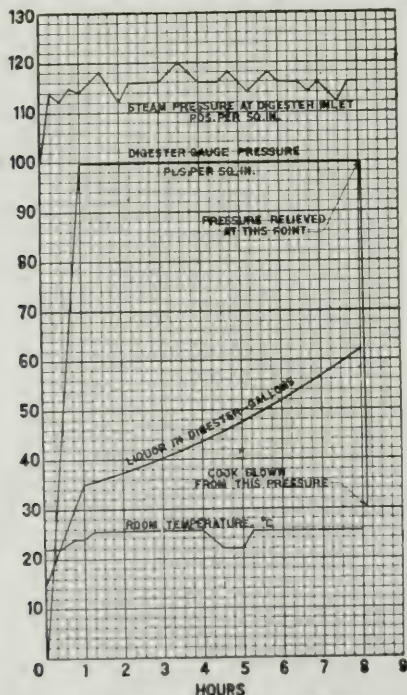


Fig. 3.—Typical graphic log of cook.

where it was diluted with water to a known volume. This mixture was then screened by means of a 6-plate diaphragm screen with slots 0.009 inch wide. The screenings which went over the plates were then collected, weighed, and sampled (sample E), as described for the crude pulp. The screened, unbleached pulp which went through the screen slots, mixed with a large amount of water, was run to a water extractor and concentrated. Afterwards it was pumped to the paper machine stuff chest, made up to a known volume with water, pumped to the machine screen (34 in. diameter, type 0.012 inch slots), and run out on a 15-ton Fourdrinier paper machine (see Pl. I.), into a sheet 10 yards wide by about 0.010–0.011 inch thick.

The rolls of the screened, unbleached pulp thus secured were stored awaiting the tests to determine its properties for which samples G to R were taken. Where the screenings were so large in amount as to preclude accuracy of sampling the crude unscreened pulp, such pulp was screened without the preliminary pressing, shredding, etc., and the screened pulp was collected on a 70-mesh sieve, pressed, shredded, weighed, and sampled for the yield determinations. The pulp was then screened again and made up into a sheet as described.

The methods used for determining dry weights, yield, quality of pulps, and composition of liquors are given in the appendix. (Appendix not given.—Ed.)

Test Material Used—Wood.

The test material consisted of 31 logs of aspen (*Populus tremuloides*, Michx.) cut from representative trees growing intermixed with white birch near Rhinelander, Wis. The trees were of seed growth, and had attained an average height of 44 feet, with straight, clear lengths of about 22 feet from which the logs were cut.

The ages of the logs varied from 28 to 42 years, as determined by counting the annual rings. The logs were fairly free from knots, considering the size of the trees and the species. Volume-weight determinations on 36 samples, representative of the whole shipment, showed the average bone-dry weight per cubic foot of green or unseasoned wood free from knots to be 26.6 pounds. The samples ranged from 23.6 to 31.4 pounds per cubic foot.

As a rule, the test material was sound, but some of the logs had decayed hearts. The material was peeled by means of a carpenter's drawknife; all decayed portions on the outside of the pieces and all protruding knots were chopped off. This cleaned wood was then sawed into disks five-eighths inch thick in the direction of the grain. Butts, tops, and all disks containing decay or other defects were culled.

The remaining sound disks were split with the grain into chips 1 inch to 6 inches by one-fourth inch by means of a special guillotine chipping machine. All knots were culled. The chips were then seasoned to constant air-dry weight, thoroughly mixed and screened to remove sawdust and dirt, and finally stored in bins to await the cooking tests.

Cooking Chemicals and Solutions.

In ordinary mill practice the soda cooking liquors are made as previously described. The freshly causticized solution contains caustic soda NaOH for the most part, but a small amount of soda ash (sodium carbonate, Na_2CO_3) still remains uncausticized. Various impurities are also present, but these are considered to have no effect in cooking.

In the experiments the cooking solutions were made by dissolving fused caustic soda, 76 per cent sodium oxide Na_2O , in water. The resulting solution was similar to the solution used in commercial practice so far as caustic soda and soda ash are concerned, and there is no reason to believe that the results should be different in any way from those which would have been obtained by the use of commercial liquors of the same concentration and causticity.

Effects of Variations in the Cooking Conditions.

The influence of the variable cooking condition in each group of tests on resultant yields and properties of pulps and consumption of cooking chemicals is shown graphically in figures 4 to 15. While, in gen-

eral, the tests were carried out in accordance with the plan which has been described, minor departures could not be avoided, and the location of certain points on the diagrams are more or less affected by such variations. For this reason the tabulated data should be consulted for the exact conditions of each cook.

Yields.

The effects on yields of pulp and screenings are expressed by the curves in Fig. 4, in which the yields are plotted against the amount of caustic soda, the duration of cooking, the pressure of cooking, and the initial concentration of caustic soda.

Amount of Caustic Soda.

With increases in the amount of caustic soda per pound of wood the yield of total crude pulp decreased at the rate of about 1 per cent for each 2 per cent of caustic (0.02 pound NaOH per pound of wood). The yield at zero caustic soda would probably fall between 80 and 90 per cent, being influenced only by the cook-

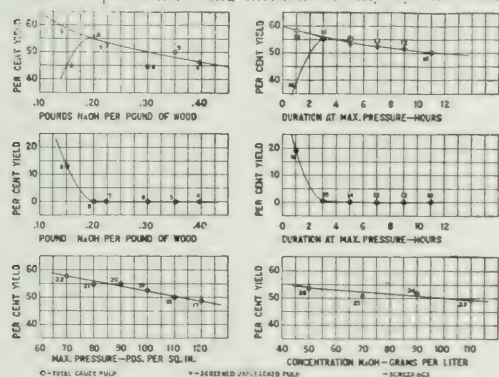


Fig. 4. Effects of cooking conditions on yields of total crude pulp, screened unbleached pulp and screenings.

ing effect of the water condensed from the steam used in cooking. For high amounts of caustic soda the curve tends to approach parallelism with the horizontal axis. The yield would not be expected to become zero unless exceedingly large amounts of caustic were used.

For amounts of caustic soda above what may be considered the minimum for successful cooking under the conditions used, the yield of screened unbleached pulp was identical with that of crude pulp, but for smaller amounts of chemical it rapidly approached zero, while under the same conditions the screenings curve naturally approaches and becomes coincident with the curve for the total crude pulp. In this group of tests the minimum amount of caustic soda for successful cooking, so far as yields alone are concerned, is somewhere between 15 and 20 per cent.

Duration of Cooking.

The duration of cooking at maximum pressure influenced the yields in very much the same manner as did the amount of chemical. The yield of total crude pulp decreased about 1 per cent for each additional hour of cooking at maximum pressure. However, the curve (Fig. 4) seems to approach parallelism with the horizontal axis, thus signifying that beyond a certain point cooking would have had no further effect.²¹ The time allowed for these cooks to reach the maximum pressure was one hour, and the extended curve indicates a yield of about 60 per cent for zero hours duration at maximum pressure. This shows that the

greater part of the cooking was accomplished during the first hour, or before the maximum pressure was attained, since during that hour about 40 per cent of the wood substance had been dissolved and the dissolving effect during the next 12 hours was only one-fourth as great.

As determined by the yield curves, the minimum duration for successful cooking under the conditions employed was between one and three hours at maximum pressure. No tests were made between these two points.

Pressure of Cooking.

The curve showing the influence of maximum cooking pressure or temperature on yields indicates that all of the tests were made at pressures above the minimum required for successful cooking, under the conditions employed for these tests; hence, no screenings were obtained from any of the cooks, and the curve for screened unbleached pulp coincides with that for total crude pulp. Increases of pressure from 70 to 120 pounds per square inch resulted in decreasing the yields of pulp about 1 per cent for each five pounds which indicates that the higher pressures increase the thoroughness of cooking, other conditions being constant.

Concentration of Caustic Soda.

The tests varying the initial concentration of caustic soda in the digester liquors were also made within limits that resulted in thorough cooking for all of the tests. Increasing the concentration under the conditions employed resulted in decreasing the yields

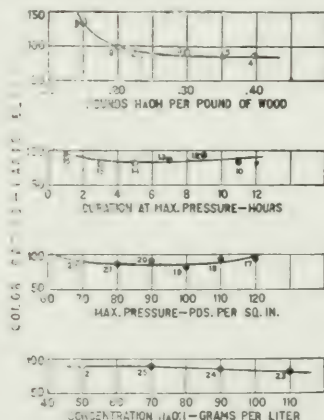


Fig. 5. Effects of cooking conditions on the color (parts black) of pulp.

of pulp about 1 per cent for each 13 grams per liter increase in concentration. It is thus evident that with a given amount of chemical the greater cooking effect is secured by means of the more concentrated solutions. A practical limit, of course, exists at the point where the volume of the digester liquor becomes too small to afford favorable cooking conditions.²²

Properties of Unbleached Pulps—Natural Color.

Curves indicating the effects of the conditions of cooking on the natural color of the unbleached pulps are shown in Fig. 5.

The larger the amount of caustic soda used per pound of wood the lighter in color was the pulp, as indicated by the "parts black" color rating, but the curve approaches parallelism with the horizontal axis

as the amounts of caustic increase. White pulps or those with zero "parts black" would not be obtained even if exceedingly large amounts of chemical were used.

Longer periods of cooking produced lighter-colored pulps up to the point where the maximum yield of screened pulp was obtained. Beyond this point there was a tendency for the pulp to become slightly darker as the duration of cooking was increased. This was probably due to the pulp fibres absorbing and retaining coloring matters from the "black liquors." It is generally believed that as the cooking becomes more thorough the cellulose of the fibres gradually becomes more gelatinous or hydrated, and would therefore tend to retain coloring matter during the subsequent leaching and washing treatments.

The pressure (temperature) of cooking seems to have had comparatively little effect on the color of the pulp within the range investigated.

The more thorough cooking resulting from the higher initial concentrations of caustic soda produced lighter-colored pulps, although the lower limit of the cooking condition in these tests was considerably above the minimum for successful cooking.

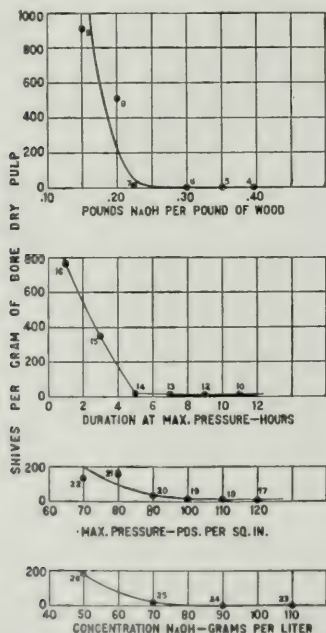


Fig. 6. Effects of cooking conditions on the occurrence of shives in pulp.

While the several curves shown in Fig. 5 indicate for each group of tests more or less change in the "parts black" color ratings or the depth of color, the hues of the pulps were not materially affected.

Occurrence of Shives.

Shives are most numerous in pulps from the less severe cooks and are entirely absent from those thoroughly cooked. The shives curves (Fig. 6) bear some resemblance to those for the yields of screen-

ings, but shives disappear from the pulps only under somewhat more severe cooking conditions than those which reduced the yield of screenings to zero. At the point of maximum yield of screened pulp the cooking has progressed far enough for the fibres to become more or less separated from each other, but not completely so, since some of them still remain in groups (shives) small enough to pass the screen slots. But as the cooking becomes more severe the fibres are entirely separated, and the resulting pulp is free from shives. In general, increasing the amount of caustic soda, the duration or the temperature of cooking, or the initial concentration of the digester liquor decreases the "shiviness" of the pulp.

Ash Content.

The curves in Fig. 7 indicate that increasing the thoroughness of cooking within certain limits decreases

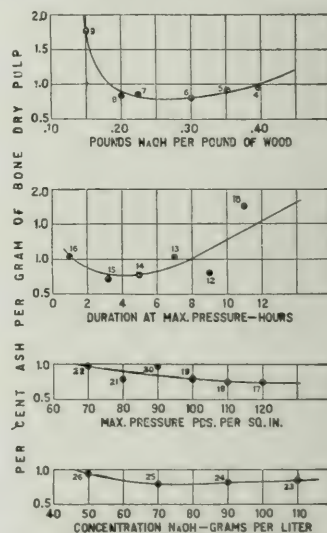


Fig. 7. Effects of cooking conditions on the ash content of pulp.

es the ash content of the pulp; outside of these limits the ash content may be increased.

Since the normal amount of ash in aspen wood is not over three quarters of 1 per cent, the high amounts in the pulps produced from this wood in some of the tests is probably due to the presence of cooking chemicals²³ which were not completely removed during the washing treatments. Increasing amounts of ash as the cooking conditions become more severe may be due to a difference in physical character of the cellulose produced under such conditions and the resultant increased difficulty of leaching out and washing away any residual and absorbed mineral matters. No tests were made to determine the character of the ash from any of the pulps.

Strength.

The strength of a pulp depends chiefly upon three factors: (1) the strength of the individual fibres; (2) the felting or matting quality of the fibres; and (3) the presence of gelatinized fibres and other matters which act as cementing materials.

Severity of cooking is attended by a weakening of the cell walls and may result in a decrease in the strength of the pulp. This decrease of strength was strongly marked in the tests in which the more severe cooking conditions were produced by increasing the amount of caustic soda. It was most rapid up to the point where the fibres were completely separated (indicated by the absence of shives), beyond which it was less pronounced. For increasing durations of cooking the general trend²⁴ of the effect was the same as for increasing amounts of chemical, but the total decrease in strength was not quite so great in amount for the range of cooking conditions investigated.

Increasing the pressure and increasing the initial concentration beyond a certain point both increased the strength of the pulp. This effect is apparently contradictory to that found for the other two groups of tests and may possibly be due to the high temperatures and high concentrations which would tend to cause

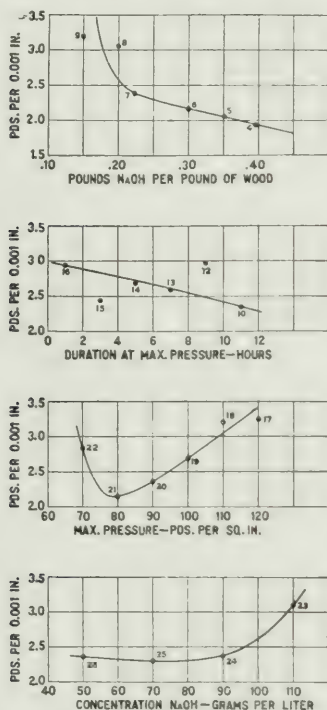


Fig. 8.—Effects of cooking conditions on the strength of pulp.

a physical change in the cellulose with increase of the cementing effect mentioned previously.

Curves showing the influence of cooking conditions on the strength of pulp are given in Fig. 8.

Ease of Bleaching.

The chief purposes of bleaching are (1) to produce a white pulp and (2) to destroy any non-cellulose materials which tend to make the pulp less durable. The more nearly the original pulp approaches to pure cel-

lulose the less is bleaching required. However, difficulty of bleaching is occasioned not only by the presence of ligneous matters, but also by coloring matters absorbed in the cell walls from the "black liquors" and by the residual cooking chemicals which the leaching and washing treatments have failed to remove. In the latter case a certain amount of bleach is neutralized by reactions with the other chemicals.

Curves expressing the effects of varying the cooking conditions on the ease of bleaching, as measured by the amount of bleach required to bring the pulps to a standard white color, are shown in Fig. 9. These curves show that under the conditions of cooking the residual ligneous matters are the most important factor in determining the amount of bleach required, since the more thorough cooking produces pulps that are more easily bleached. The decrease in amount of bleach required was very rapid up to the point where shives were eliminated; beyond this point the effect was less marked. It must not be assumed that the shives alone necessitated the larger amounts of bleach. The

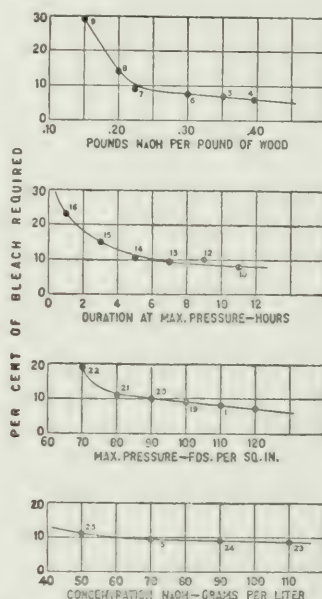


Fig. 9.—Effects of cooking conditions on the ease of bleaching.

presence of shives indicates an incomplete cooking reaction and implies that considerable ligneous matter may remain in the other (completely separated) fibres.

The effect of severity of the cooking conditions is especially noticeable in the curves for the tests varying the amount of caustic soda and the duration of cooking, since certain of the pulps produced in these tests were less thoroughly cooked than any of those from the other groups.

Loss on Bleaching.

The curves showing the losses on bleaching as affected by the varying cooking conditions are given in Fig. 10. As would be expected, the loss decreased with thoroughness of cooking. In the tests varying the amounts of chemical and the durations of cook-

ing the rate of decrease in bleaching loss with greater severity of cooking was fairly constant, but it is probable that if the cooking conditions were extended for higher values than those used the curves would approach parallelism with the horizontal axis. Such an effect was obtained for the tests in which the cooking pressures were varied. It is not reasonable to believe that more severe cooking would result in pulps which would suffer no loss whatever on bleaching.

Table 4.

Cook No.	Concentration of NaOH.	Yield of total trade pulp.	Yield of screenings.	Bleach required.	Loss on bleaching.
	Grams per liter.	Per cent.	Per cent.	Per cent.	Per cent.
1	80	41.10	0.10	15.4	3.92
2	50	44.23	.03	14.7	4.08
11	30	46.97	.07	15.8	4.68

Each cook employed seven hours' duration at 110 pounds pressure per square inch. The caustic soda charged amounted to a 25 pound net pound of wood. For complete information see appendix, Table 15.

The plotted points for the tests in which the initial concentrations were varied are so few in number and so irregular in location that they give little indication of the influence of this factor. However, additional information is obtained from some earlier tests of the Forest Service, summarized in Table 4.

These data indicate that increasing the concentration reduces the loss on bleaching, hence the curve in figure 10 has been drawn to show such an effect. This is substantiated by the fact that varying the amount of chemical and the duration and pressure of cooking in each case showed a reduction in the

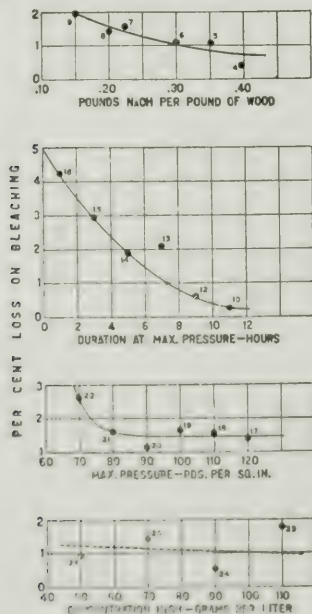


Fig. 10. Effect of cooking on the bleaching loss.

required curves) show more severe cooking with the higher concentrations.

The relatively large amount of loss in the case of cook 23 does not seem to be warranted in view of the well-cooked condition of the pulp. However, the comparatively high strength of the pulp indicates an abnormal condition.

The loss in weight of a pulp during bleaching is due primarily to the removal of the colored ligneous matters and to the partial destruction of the cellulose itself. The matter is especially liable to occur if the bleaching treatments are severe, or if the cooking treatments have left the cellulose in an easily oxidized condition, so that it is either dissolved during bleaching or broken up into small particles, which are removed in the washing operations. The partial removal of the mineral or ash-forming constituents from the pulp may also occasion some loss. On the other hand, the ash in bleached pulp sometimes tends to increase over that for the unbleached pulp (due to an accumulation of lime compounds and other residues from the bleaching solution), and hence may offset the loss due to other causes.

Relation Between Properties and Yields.

Many of the curves expressing the effects of the varying cooking conditions on the properties of the unbleached pulps have bends or "breaks" at or near the values for the cooking conditions which result

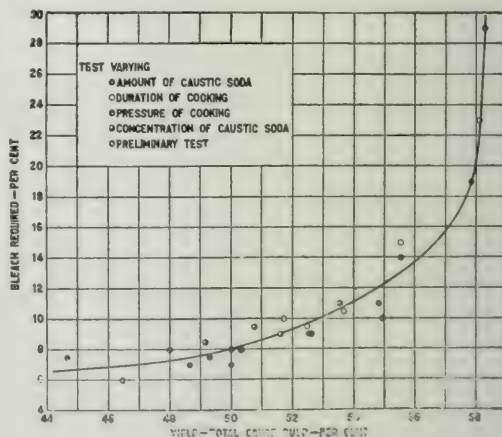


Fig. 11. Relation between yields and ease of bleaching.

ed in the highest yields of screened pulp. So general is this that, with decreasing severity of cooking, the occurrence of sudden changes of direction for curves expressing properties affords a reliable indication that the yield of screened unbleached pulp is near its maximum. This is especially evident in the curves for ease of bleaching.

That properties of pulps are directly dependent upon yields is well illustrated when amounts of bleach required are plotted against yields of total trade pulp as in Fig. 11. Values for all of the cooks made in these experiments have been plotted, irrespective of the testing condition under which they were secured. It is evident that cooks which resulted in decreased yields

showing losses as the severity of cooking increased, and that most of the other curves for the effect of concentration, especially the yield, slaves and bleach

produced easier bleaching pulps. For the higher values slight differences in the ease of bleaching, but the effect rapidly diminishes until a large decrease in the yields affords little difference in the amounts of bleach required. This would be expected in view of the nature of the cook reactions. The effect is first to remove the intercellular substances and part of the ligneous matters from the wood, then the cellulose itself begins to be attacked, and finally, after the greater part of ligneous matters has been removed, the cellulose alone is affected. The ease of bleaching is a measure of the amount of non-cellulose matters present in the pulp.

Other properties of the pulps when similarly plotted against yields show more or less definite relationships,

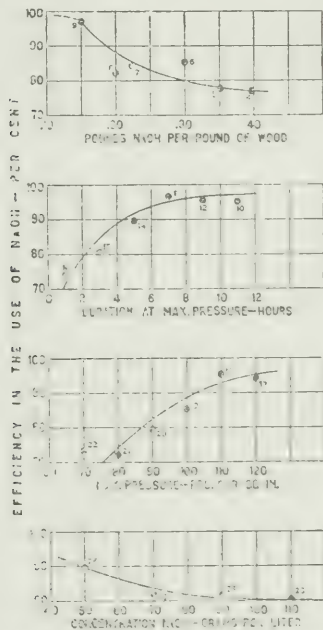


FIG. 12.—Effects of cooking conditions on the efficiency of the use of caustic soda.

but are apt to be modified according to the cooking condition varied. For instance, when varying the amount of caustic soda or the duration of cooking, decreased yields were attended by decreased strength of pulp; when initial concentrations or pressures were varied, the strength increased as the yields decreased. Natural color, shives, and screenings, however, were little affected for yields below 54 per cent., no matter how produced; for higher yields the color, shives and screenings increased rapidly with increasing yields. The losses on bleaching followed fairly closely the amounts of bleach required, and hence decreased as the yields decreased.

Significance of Properties.

There are at present no accepted standards of quality or market grades of soda pulps. What may be sufficiently good quality for one purpose or one mill may be poor or medium quality for another. Aside from bulkiness and opacity, which depend mainly on condi-

tions not studied in these experiments, the desirable properties of a pulp are, in general as follows:

- 1) Low percentage of bleach required.
- 2) Low loss of bleaching.
- 3) High strength.
- 4) Durability (resistance to wear and decomposition).
- 5) Low ash content.
- 6) Few shives.
- 7) Absence of dirt.
- 8) Light color for the unbleached pulp.
- 9) Whiteness of the bleached pulp with freedom from certain undesirable tints.

It is not often that any one pulp has the advantage over another in all these properties, and for many uses some of them are of no importance. For aspen-pulp, or other short-fibred pulps used in the manufacture of book papers the properties which are given most consideration are freedom from dirt and shives and low percentage of bleach required, with the attendant low loss on bleaching. Both undercooked and overcooked pulps are to be avoided.

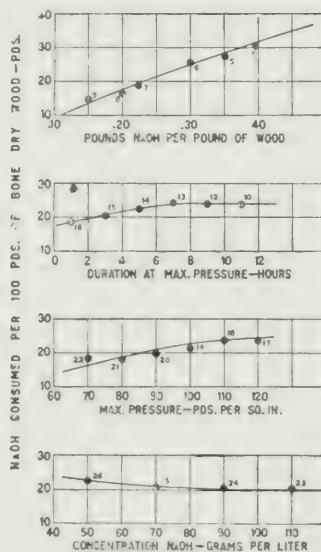


FIG. 13.—Effects of cooking conditions on the amount of caustic soda consumed.

Consumption of Caustic Soda.

By consumption of caustic soda is meant the neutralization of the free or active caustic soda (NaOH) existing as such in the digesting liquors. The neutralization results from the combination of the sodium (Na) of the alkali with the acid products derived from the hydrolysis of the lignified fibres during the cooking. The black liquors at the end of the cooking treatment contain in dissolved form these non-alkaline, sodium compounds, together with the remaining free caustic soda.

The effects of varying the cooking conditions on the consumption of caustic soda, expressed in per cent of the amount charged or the efficiency in its use, are shown in Fig. 12. The actual consumption in pounds per 100 pounds of wood is shown in Fig. 13.

As would naturally be expected, the greatest comparative efficiency for the cooks made with varying quantities of caustic soda resulted from the use of the smaller amounts. However, when very small amounts were employed, the cooking reactions were not sufficiently complete,²⁶ as indicated by the curves for yields and properties of the pulps. In this group of tests well-cooked pulps were first obtained with about 0.2 pound of NaOH per pound of wood. The efficiency in the use of the caustic at this point was about 85 per cent.

With increasing durations of cooking the efficiency in the use of caustic soda steadily increased until it reached a constant maximum value.

An efficiency of 95 per cent was obtained by seven hours' cooking at maximum pressure and since no greater efficiency was secured by continuing the cooking four additional hours, it is apparent that this represents the maximum efficiency attainable. That the cooking reactions are not due entirely to the presence of active caustic soda is indicated by the fact that after 95 per cent efficiency had been attained increased durations resulted in some further cooking effect²⁷ (see curves for yields and properties of pulps) with no increase in the amount of chemical consumed. Increasing the pressure also resulted in greater efficiency in the use of caustic soda until a maximum of 95 per cent was obtained.

In all groups of tests in which a constant amount of caustic soda was charged into the digester for each cook, greater percentage efficiency in its use could mean only a greater actual consumption of the chemical. In the group of tests varying the amounts of caustic soda, the decrease in percentage efficiency was accompanied also by increase in the actual consumption. It is thus apparent that the more thorough cooking, whether produced by increasing the amount of chemical in the charge or the duration or the pressure of cooking, is in large part at least, due to the greater completeness of the reaction between the chemical and the wood.

The tests employing various initial concentrations of caustic soda in the digester liquors (the amount of caustic soda charged always remaining the same) seemingly do not bear out this conclusion.

In most respects the determinations of yields and properties of the pulps in these tests indicated that the more concentrated solutions resulted in more thorough cooking, but no increase in the consumption of chemical occurred; in fact, with increase of concentration, a decrease of consumption and subsequently decrease of percentage efficiency are indicated. While the possibility of error is not eliminated,²⁸ this result indicates the need for further investigation.

Relation between Caustic Soda Consumed and Yields

For the purpose of further studying the cooking effects of the various conditions employed, yields of total crude pulps from all of the cooks were plotted against amounts of caustic soda consumed per 100 pounds of wood charged (Fig. 14). The average curve drawn through these points indicates a definite relation between yields and amounts of caustic soda consumed, regardless of the cooking conditions. However, even if it is assumed that the location of some of the points is due to experimental errors, the relation, as regards individual cooks, can be only an approximate one, since it has already been pointed out that in some of the tests increased cooking effects were obtained without any increase in the consumption of caustic

soda. If the curve were produced for lower amounts of caustic soda, the yields would probably be somewhere between 80 and 100 per cent at zero consumption, since under these conditions cooking could still be effected by water alone.²⁹

Since the completion of these experiments Mr. E. Sutermeister has published³⁰ the result of some tests in which a small rotary autoclave and copper flasks were used as cooking vessels. Yields varying from 93 to 24 per cent and consumptions of caustic soda varying from 0 to 29 pounds per 100 pounds of wood were

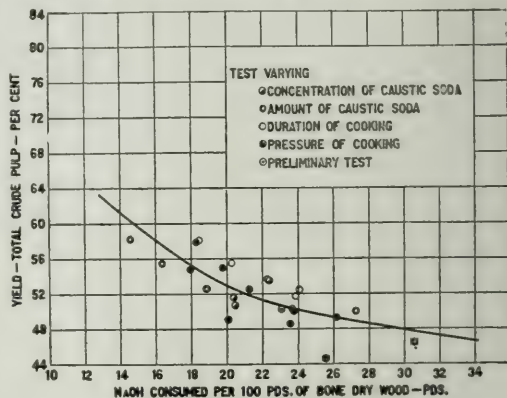


Fig. 14.—Relation between yields and amount of caustic soda consumed.

obtained,³¹ giving a relation similar to that indicated by the curve in Fig. 14. However, in his experiments a greater reduction of yields was obtained per unit decrease in the caustic soda consumed, which is probably due to differences in test material, method of experimentation and apparatus employed.

The actual consumption of caustic soda during cooking is a factor which is not given sufficient consideration in commercial practice, although it is one of considerable importance for an intelligent control of the cooking operations. By a careful study of the consumption, together with the other effects of the various cooking conditions. That pulp mills do not ordinarily determine the consumption of caustic soda and the efficiency of its use is due to the length of time necessary for the analysis of the black liquors. While the method used in these experiments requires some time for carrying out the analysis, its occasional use in commercial operations would be of benefit in determining the conditions to be used in future cooks.³² If there were a rapid and accurate method of analysis such as is used in sulphite mill operations, it would assist in determining when the cooking had progressed far enough, at which time the digester could be blown. Production of undercooked or overcooked pulps would thus be avoided.

Severity of Cooking as Indicated by Microscopic Appearance of Fibers.

A good indication of the thoroughness or severity of cooking may be obtained by microscopic examinations of the pulp fibres³³. The effects of varying the cooking conditions are shown in figure 15; curve A represents the relative abundance of vessels in the pulps; curve B, the ray cells; curve C, the fibre bundles or shives; curve D, the prominence of the ves-

sel markings; and curve E, the apparent strength of fiber walls. Since there are no absolute units for measuring these effects, the ordinates as shown for each curve represent arbitrary units ranging from 0 to 10. The photomicrographs in Plates II to VII, inclusive, present some of the more pronounced effects³⁴, while various gradations resulted,³⁵ the experimental pulps may be classified in the following three groups:

Overcooked pulps.—Severe digestion treatments resulted in “over-cooked” pulps, examples of which are seen in Plates II and III. The walls of the fibers show a considerable degree of weakness, as indicated by their thin transparent appearance and by their much twisted and fractured condition. The relative number of vessels present in the pulp is low as compared

able even when the microscopic slides are examined with the naked eye. Undercooked fibers develop a deep color from the particular stain used in mounting, and on this account appear very distinct.

Of the several groups of tests, the one varying the amounts of caustic soda per pound of wood resulted in the greatest range of severity of cooking as determined by the microscopic appearance of the pulp fibers. A small amount of chemical resulted in an undercooked pulp. With increases in the amount the strength of cell walls gradually decreased, the wood vessels suffered gradual destruction, and their markings were dimmed. The ray cells and fiber bundles disappeared soon after the point was reached where the maximum yield was attained. The higher amounts of caustic gave the overcooked effects.

For varying durations of cooking the effect was practically the same, and undercooked pulps were obtained at the shortest duration used. However, the highest durations employed did not give as severely

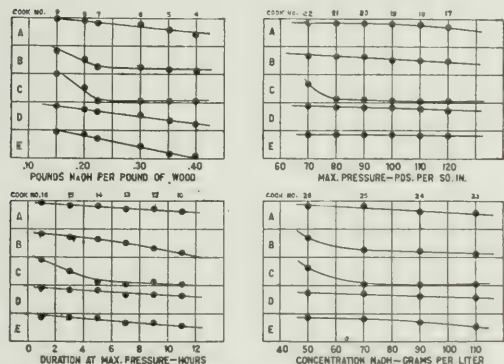


Fig. 15.—Effects of cooking conditions on pulp fibers. A, abundance of wood vessels; B, ray cells; C, fiber bundles, or shives; D, prominence of vessel markings; and E, apparent strength of fiber walls.

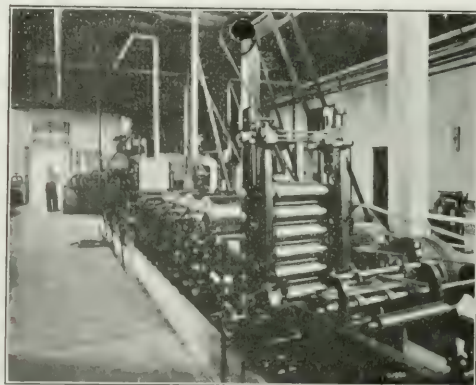


Plate 1.—Paper Machine, Forest Products Laboratory, Madison, Wis.

with the normal number present in the wood, and the pits and other markings on them are only dimly visible. Many of the vessels remaining are ragged and partly disintegrated; and the pulp, for the most part is also characterized by an absence of the comparatively thin-walled, delicate ray cells. Fiber bundles also are absent, since these are made up of fibers bound together by groups of the brick-shaped ray or parenchyma cell. The indistinctness of the vessels and fibers is due chiefly to the removal of the lignous infiltrations of the cell walls, in consequence of which the elements developed very little color from the particular stain used in making the microscopic mounts.

Well-cooked pulps.—Pulps produced under less severe conditions are made up of stronger fibers, such as shown in Plates IV and V. The middle treatments are apparent in the increasing number of ray cells and vessels, the latter being well preserved and showing their markings quite clearly. The fibers are twisted or broken to only a small extent, and yet are so well separated that there are no fiber bundles.

Undercooked pulps.—Plates VI and VII illustrate the characteristics of undercooked pulps, and show plainly the mildness of the digestion treatments employed in their production. Well-preserved vessels with sharply defined markings are clearly visible, ray cells are numerous, and the walls of the fibers are less dissolved away than in the more thoroughly cooked pulps. Coincident with these characteristics, there are also present many fiber bundles or shives, notice-

able even when the microscopic slides are examined with the naked eye. Undercooked fibers develop a deep color from the particular stain used in mounting, and on this account appear very distinct.

Influence of Cooking Conditions on Cost.

While it is not feasible from the data at hand to discuss all cost factors affecting the commercial production of pulps, the more direct effects of the cooking conditions employed can be shown. The actual effects on the cost of production, of course, depend upon various other operating conditions at any particular mill, but the general trend of the effects is the same, irrespective of local conditions.

Time.

Shorter durations of cooking result in more efficient use of the digesting apparatus; more cooks can be made per day or per week, and, as has been shown, yields of pulp per unit of wood are also increased, and consequently more pulp is secured per cook. The

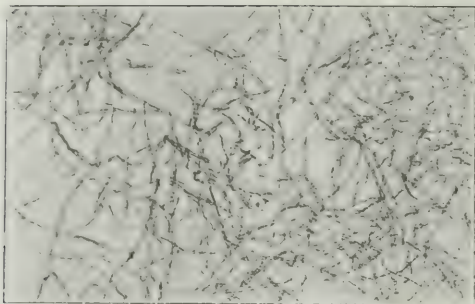


PLATE II.

Fibers of an Over-Cooked Pulp Produced with a Large Amount of Caustic Soda. (Cook 4.)

Partial disintegration has taken place. The fibers are fragmentary and contorted with rather weak cell walls. The vessels with barely visible markings are on the point of being eliminated.

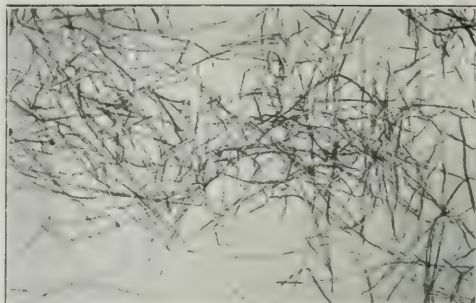


PLATE V.

Fibers of a Well-Cooked Pulp Produced with a High Pressure of Cooking. (Cook 17.)

This is a strong, well-separated pulp.

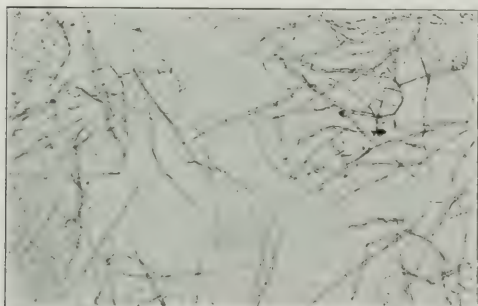


PLATE III.

Fibers of an Over-Cooked Pulp Produced with a High Concentration of Caustic Soda. (Cook 23.)

The fibers are somewhat fragmentary.

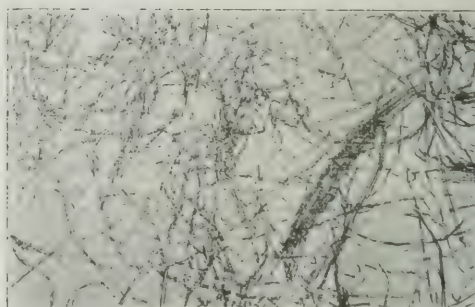


PLATE VI.

Fibers of an Under-Cooked Pulp Produced with a Short Duration of Cooking. (Cook 16.)

Many shives, consisting of two or more unseparated fibers which parallel each other, are present.

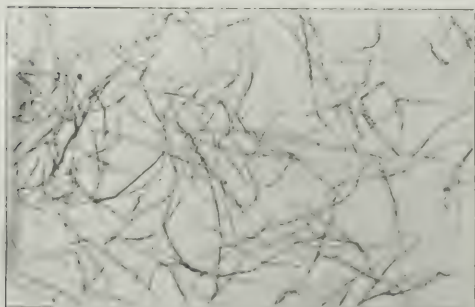


PLATE IV.

Fibers of a Well-Cooked Pulp Produced with a Medium Amount of Caustic Soda. (Cook 7.)

The fibers are strong and well-separated. The vessels are well marked.

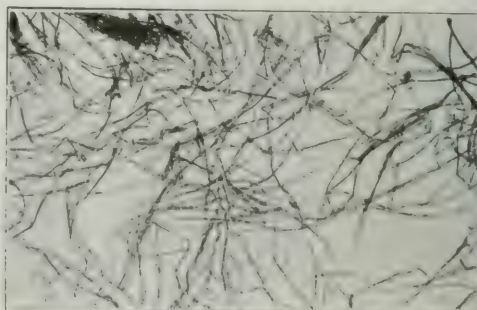


PLATE VII.

Fibers of an Under-Cooked Pulp Produced with a Small Amount of Caustic Soda. (Cook 9.)

The fibers are strong and well-separated. The vessels are well marked. The fibers are strong and well-separated. The vessels are well marked.

greater plant capacity thus obtained would result in a proportionate decrease of operating costs per ton of pulp.

Figure 16 shows the production of pulp per 24 hours continuous operation for each 100 pounds of wood capacity of digester as influenced by various durations of cooking. The curve was derived from the experimental data, assuming a one-hour period for blowing the digester after completing a cook and for charging the next cook, and a similar period for attaining maximum cooking pressure. Thus, for a three-hour period at maximum pressure, the total time between the charging of two consecutive cooks is five hours. Computation shows that decreasing the duration at maximum pressure from eight to five hours increases the daily output 48 per cent, while a decrease from ten to three hours increases the output 156 per cent. If the time allowed for blowing and charging the digesters and for raising the digester pressure is decreased, the increase in the daily output will be even more pronounced as the duration of cooking is shortened.

Steam Consumption.

While the consumption of steam varies with the duration of cooking, it is influenced also by the pressure maintained in the digester and more by the relative

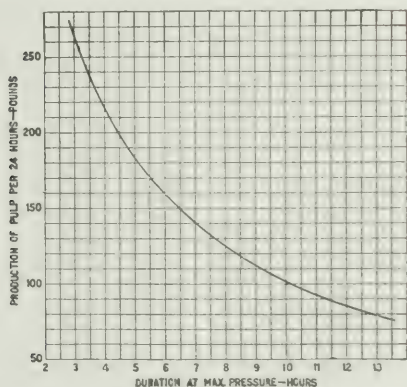


Fig. 16. Effect of duration of cooking on production in 24 hours.

volumes of the liquor charge. Under the testing conditions employed, the volume of liquor varied both with the amount of caustic soda charged (the concentration being constant) and with the concentration (the amount of chemical being constant). Since the heating was accomplished by steam blown directly into the digester, a measure of the amount of steam used is afforded by the increase in the volume of liquor during cooking.³⁶ The effects of the cooking conditions on the resultant condensations are shown in figure 17. Curves showing the initial volumes of digester liquors for two of the groups of tests are also included in the same figure.

In the tests employing various proportions of caustic soda, the amount of liquor at the start of cook varied directly with the amount of chemical, as shown by the straight-line curve. The condensation also increased rapidly as the amounts were increased. The downward turn in the heavy-line curve for the higher proportions of caustic is caused by the digester becoming filled and overflowing through the top relief

during the final stages of cooking. However, the dotted line shows the corrected curve, taking the overflow into consideration. The rapid increase in the condensation is a natural consequence of increasing the amount of cooking liquor, which has a high specific heat.

In the tests employing various cooking periods the main influence on steam consumption was the heat lost by radiation, since the initial volumes of digester liquors were constant. The curve in figure 17 representing this effect has been drawn as a straight line to show only the general trend. It will be observed, however, that the platted points occur in two distinct groups. That the reaction between wood and caustic soda is of an exothermic or heat-generating nature may partly explain this arrangement. In the one group, representing the cooks of longer duration, the cooking reaction was practically completed before the end of the cooking period (see analogous curves in Figs. 12 and 13). This would result in relatively higher amounts of condensation, since no heat of reaction would be generated during the later stages of cooking.³⁷ The same explanation could apply to the cooks made at the higher pressures.

The influence of higher cooking pressures on steam consumption results from the greater amount of steam required to heat the digester and its contents to the

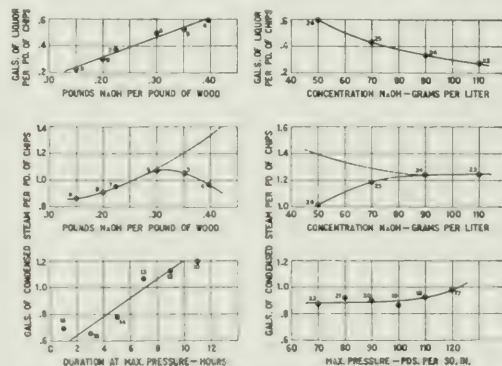


Fig. 17. Effects of cooking conditions on initial volume of digester liquors and on consumption of steam.

higher temperatures. The initial volumes of cooking liquor did not vary. The condensation curve indicates that this effect was comparatively small in the tests.

Like the tests varying the amount of caustic soda, those varying the initial concentration influence the steam consumption principally by the amount of liquor in the charge, which varies as shown by the true hyperbolic curve in figure 17. Hence, increasing the initial concentration decreased the condensation, as shown by the corrected curve in figure 17, which takes into account the overflow of the digester in cooks 25 and 26.

In considering these results from a commercial standpoint it should be kept in mind that the experimental apparatus was comparatively small. On this account the heat or steam required for raising the temperature of the digester and for replacing heat lost by radiation per unit of digester capacity was far greater than would be experienced in mill operation. Hence, much less steam per pound of chips would be required in commercial operations than is shown by

these curves. The effects of increased duration of cooking and increased pressures especially would be much less pronounced, since with these radiation is the more important factor.

Aside from the direct cost of steam, the condensation is of importance in another way. The tests have shown that decreased initial concentrations, other cooking conditions being constant, result in less severe cooking. It is to be expected that the decrease of concentration throughout the cooking period, due to condensation, also tends to minimize the cooking effects in a similar manner.¹⁸

The use of superheated steam in cooking, the installation of larger digesters, the insulation or lagging of digesters, and the use of the minimum volume of cooking liquors at the start of cook are means frequently employed by pulp mills to reduce the condensation.

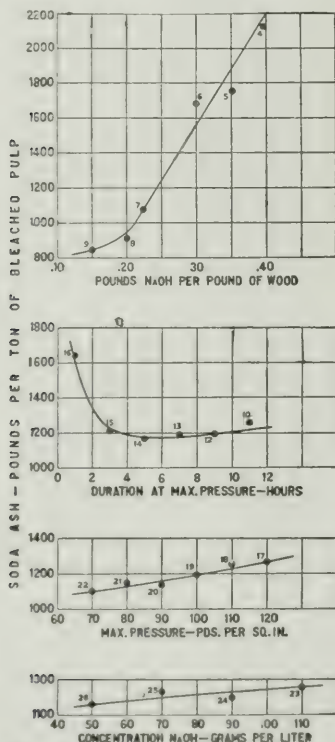


Fig. 18—Effects of cooking conditions on amount soda ash employed per ton of pulp.

Chemicals Per Ton of Pulp.

The chemicals directly employed in the manufacture of soda pulp affect cost of production, in that the full amount of alkali charged to the digester can not be recovered, while the bleaching powder after being used is of no further value. The curves in figures 18 and 19, expressing the effects of the cooking conditions on the amounts of chemicals employed per ton of dry, bleached pulp, were derived from the experimental data as explained on page 48, appendix. The amounts shown are less than those generally employed in commercial practice, for several reasons:

(1) The yields of pulp are higher; (2) the losses on bleaching are less; (3) the amounts of chemical charged per pound of wood are less; and (4) the amounts of bleach required are less. Whether or not pulp mills can duplicate or approach these results, the general trend of the curves would not be affected.

Soda Ash.

The amounts of caustic soda and sodium carbonate charged to the digester in the several groups of tests have been calculated to show the equivalent amounts of commercial soda ash (58 per cent Na_2O) per ton of bleached pulp produced. (Fig. 18.) Increasing the amounts of caustic soda charged per pound of wood obviously results in increasing amounts of soda ash per ton of pulp, and the decreased yields of pulp resulting from the more thorough cooking make the effect more pronounced. A bend is found in the curve at the point of maximum yield, since for am-

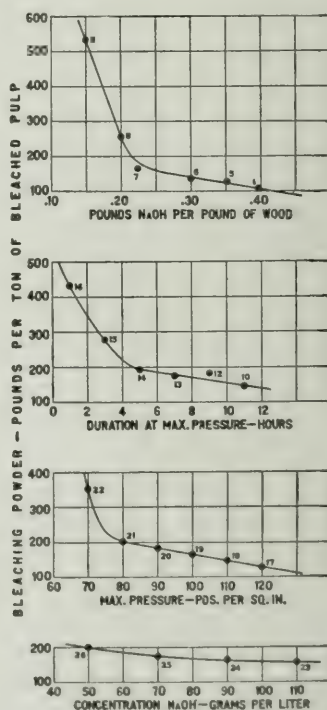


Fig. 19—Effects of cooking conditions on amount of bleaching powder employed per ton of pulp.

ounts of caustic below this point the yields decrease rapidly and their influence on the amount of soda ash employed per ton of pulp becomes more apparent.

When varying the durations and the pressures of cooking and the initial concentrations, the amounts of soda ash per ton of pulp were affected by yields alone, and the minimum amount is employed under conditions which give the maximum yields. Increased durations, pressures, and concentrations afford decreased yields, and the amount of soda ash per ton of pulp consequently is increased. The plotted point for cook 10 is not on the curve, due to the initial diges-

ter liquors for this cook having had about 3 per cent lower causticity than the other cooks in this group of tests. Lower causticities involve the use of a greater amount of soda ash for the same amount of caustic soda.

Bleaching Powder.

The curves in figure 19 show that increasing the amounts and concentrations of caustic soda and the durations and pressures of cooking result in all cases in decreasing the amounts of bleaching powder consumed.

Yields do not influence the calculations, since the consumption per ton of bleached pulp depends on the per cent of bleach required and the bleaching losses. The ordinates for the curves represent bleaching powder of 35 per cent available chlorine, and losses in making the bleaching solutions are disregarded.

Combined Cost of Wood and Chemicals Per Ton of Pulp.

The curves in figure 20 show costs for certain items in producing a ton of bleached pulp (2,000 pounds air-dry basis) as influenced by variations in the cooking conditions. Curves marked A represent cost of wood alone; curves B, cost of wood and soda ash; and curves C, cost of wood, soda ash, and bleaching powder. The vertical distances between curves A and B represent cost of soda ash alone, and those between curves B and C represent cost of bleaching powder alone.

The cost values were obtained by calculations from the amounts of wood, soda ash, and bleaching powder consumed, based on the experimental results.³⁹ A 90 per cent recovery of the cooking chemicals charged to the digester was assumed in determining the amounts of soda ash consumed or lost per ton of pulp. The basic units for costs are assumed average values as follows:

Wood, \$9 per solid cord (100 cu. ft.); soda ash (58 per cent Na₂O), \$1 per 100 pounds; bleaching powder (35 per cent available chlorine), \$1.55 per 100 pounds.⁴⁰ The bone-dry weight of aspen wood is taken as 26.68 pounds per cubic foot of clear wood, green volume.

With increasing amounts of caustic soda in the digester charges the cost due to all three factors is decreased until the point of maximum yield of good pulp is attained, after which the total costs increase, due to the increasing amounts of wood and of soda ash consumed. The decreasing cost of bleaching powder only partially offsets the increase due to the other two factors.

With increasing durations the effect is practically the same, so far as wood alone is concerned, except that the increase in its cost for higher durations is not so pronounced as with increasing the amounts of caustic soda. The soda-ash costs alone are practically constant, and hence increase the wood costs by a constant amount. However, as the durations increase the bleaching-powder costs decreased sufficiently to overcome the effect of increasing wood costs. After the minimum duration for successful cooking (as determined by yields) has been exceeded, the decrease in total cost is very small, and would not be sufficient to offset increased costs incident to the time element discussed previously.

For variations in the pressures of cooking, the influence of bleaching-powder costs is especially marked. The minimum costs due to wood and soda ash result

from the use of the lower pressures. When bleaching is considered, the minimum cost is obtained by using medium pressures, although the increases for the higher pressures are very small.

Combined costs for the three factors are practically unaffected by variations in the initial concentrations, but if bleaching is omitted the costs of wood and soda ash are larger with the higher concentrations.

All of the diagrams show that of the three cost factors considered, wood is of the most importance and that bleaching powder is more influential than soda ash in determining total costs. Increases in costs of wood and soda ash with increasing severity of cooking are, in all cases, offset to a greater or less extent, by decreases in bleaching-powder costs. If maximum or minimum values⁴¹ had been used for either wood, soda ash, or bleaching powder, instead of the average value, or if a different percentage recovery for the soda ash had been assumed, the general effects would not be changed, although they might become more or less pronounced.

Summary.

(1) The amount of caustic soda per pound of wood, the duration of cooking, the pressure or temperature of cooking, and the concentration of the cooking chem-

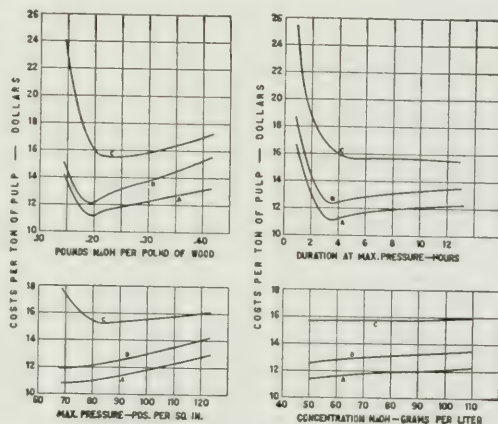


Fig. 20.—Effects of cooking conditions on cost items per ton of pulp. A, wood; B, wood and soda ash; and C, wood, soda ash, and bleaching powder.

icals employed in the production of soda pulp influence the yield and properties of the pulp by influencing the severity of the cooking reactions.

(2) Severity of cooking is an effect mainly of the amount of caustic soda consumed per unit of wood. Increasing the amount or concentration of the chemical or the pressure of cooking produces a quicker reaction and hence one more complete in a given length of time. Increasing the duration results in a more complete reaction because of the longer time allowed for the available caustic soda to be consumed.

(3) Greater severity of cooking is accompanied by a decrease in the yield of crude pulp, and usually of screened pulp. If screenings are present in considerable quantity (due to incomplete cooking), more thorough cooking increases the yield of screened pulp.

4) The properties of the pulp are influenced by greater severity of cooking as follows:

- Shives are decreased in number or eliminated.
- Bleaching is rendered more easy and the loss on bleaching becomes less.
- The strength may either decrease or increase, depending upon which cooking conditions is varied and the degree of variation.
- The color of the unbleached pulp becomes lighter within certain limits, beyond which it may, under certain conditions, become darker.

5) A good indication of the severity of cooking is the appearance of the individual fibers when examined under the microscope.

6) The decreased yields resulting from more severe cooking result in a greater cost of wood and soda ash per ton of pulp. As a rule, the smaller cost of bleaching powder incident to the more easily bleached pulp produced by thorough cooking only partially offsets the greater cost of wood and soda ash.

7) While the amount of bleach required decreases with increasing severity of cooking, a point is soon reached where the decrease in bleach required is not commensurate with the decrease in yields.

8) Increasing the initial amount of digester liquor increases the condensation and steam consumption (and hence the cost) because of the greater volume to be heated; increasing either the duration or pressure has a similar effect because of the greater losses of heat by radiation.

9) Yields (bone-dry basis) of well-separated unbleached pulps as high as 56 or 58 pounds per 100 pounds of wood can be obtained from aspen if the wood is of the best quality. Yields of from 54 to 55 per cent were obtained which required only from 10 to 11 per cent of bleach. The variation in yields obtained by changing the cooking conditions was from 46 to 58 pounds per 100 pounds of wood charged, or about 26 per cent based on the lowest yield.

10) Minimum total durations of from 3 to 4 hours may be successfully applied to the cooking of aspen for bleaching pulps, provided the other cooking conditions are properly maintained.

11) Aspen may be successfully cooked with a minimum of from 20 to 25 pounds of caustic soda charged per 100 pounds of wood. The amount of this chemical actually consumed in the production of well-cooked bleaching pulps varies from 18 to 24 pounds per 100 pounds of wood.

Practical Value of Results.

The experiments discussed in this bulletin have shown in detail the effects of certain cooking conditions on the yields and properties of the resultant pulp, on the efficiency of the cooking chemicals, and on various items affecting costs of production. From a study of these results it should be possible for a mill operator to so regulate the cooking process as to secure the largest possible yield of pulp of the desired quality at a minimum cost for chemicals, fuel, labor, and overhead charges in so far as the operation is affected by the cooking conditions considered.

The cheap sound wood used in the experiments afforded yields of good pulp from 10 to 20 per cent higher than the better pine of the yields reported by pulp mills. Moreover, some of these experimental yields were obtained with shorter cooking periods and

less chemicals than are employed commercially. Although the laboratory results may not be equalled in mill practice, the possibility of greatly increased efficiency in the process of converting wood into soda pulp is indicated.

The Appendix to Dr. Surface's bulletin is not reproduced in these columns. This portion of the treatise deals with the qualities of aspen as a raw material for paper pulp, and the nature of the pulp produced. There are also records of the series tests, with tables, description of methods for auxiliary tests for properties of unbleached pulp, and analyses of soda liquors.

The results of autoclave tests made in 1909 by Mr. Sutermeister form an interesting study and a bibliography, giving references on the properties of aspen and its use as a pulp wood, the soda process, and the effects of caustic soda and water and cellulose brings to a close a most enlightening treatise.

Reference Notes.

Manufacturers' analysis.

*The numerals opposite each platted point on the curves are the serial numbers of the cooks. (See Tables 10 to 14.)

†See Tauss's experiments, Table 1.

‡Tauss used for a single boiling as high as 7 pounds of caustic soda per pound of wood, and the yield or undissolved material after three hours at 58.8 pounds per square inch steam pressure amounted to 8.52 per cent for beech and 2.85 per cent for pine. With 4 pounds caustic soda per pound of wood in each of three successive three-hour treatments under a steam pressure of 132.3 pounds per square inch, the yields for the two woods were 26.61 per cent, and 18.20 per cent, respectively. This latter proportion of caustic soda was ten or more times as great as is ordinarily employed in commercial practice. Also the other cooking conditions were proportionately more severe.

§Figures 12 and 13 show that the active cooking chemical was consumed at the end of 7 hours at maximum pressure, it is therefore not apparent from these tests what would be the effect of continued cooking in the presence of available caustic soda.

¶As the initial concentrations increased the volume of digester liquors at the start of cook decreased (see Fig. 17), since the amount of caustic soda was held constant. Hence, increasing concentrations would eventually result in a volume of digester liquor so small that the whole charge of chips would not be covered until late in the cooking period after the liquor had been sufficiently diluted by the condensed steam used in cooking. In this case part of the chips would receive very severe treatment while the remainder would more or less escape the cooking effect. The resulting pulp would represent a composite of the two conditions.

Special precautions were taken to eliminate the influence of dirt. Further it does not seem reasonable that the cooking action which removed the lignin and other organic matters should have produced in the fibrous residue or pulp a concentration of the mineral constituents which go to form the wood ash.

§The data are not sufficient for expressing the effect in detail. The true curve would be expected to have a bend coinciding with the point of maximum yield of screened pulp at the point where the shives are reduced to zero.

§See Dr. Cox's discussion, p. 9.

¶It is a well known chemical law that in order to carry a reaction to a given degree of completion for one of the reactants, substance it is necessary to have available a certain excess of the other chemical or chemicals which take part in the reaction. This means that the efficiency in the use of the chemical can not be 100 per cent. The speed of the reaction is proportional to the amount of the excess.

¶For the effect of water alone, see Tauss's experiments, Table 1.

¶The test data show a loss of digester liquor overflowing through the top relief for cooks 25 and 26 (that for cook 26 showing the greatest loss), and it is due to the platted

points for these two cooks that the curves indicate greater consumption of caustic soda at the lower concentrations.

²⁸See Tauss's experiments, Table 1.

²⁹Paper, p. 15, No. 2, vol. 9, Sept. 25, 1912.

³⁰In obtaining yields higher than 75 per cent, the test material was treated at atmospheric pressure. Under this condition the cooking effect of water alone would have but little influence unless long duration of treatment were used.

³¹The boiling of rags with caustic soda solutions for the production of rag pulps is controlled in this manner.

³²For the normal appearance of fibers in the uncooked wood see Plates VIII and IX, as well as in the discussion on p. 42.

³³Plates 8 and 9 not reproduced.—Ed. Pulp and Paper Magazine.

³⁴The remarks following the title of each plate and the discussion in the text are not based on the fields shown in the photomicrographs alone.

³⁵The photomicrographs, in the order of their sequence, show gradations of severity of cooking.

³⁶The steam used was not perfectly dry, containing a small amount of moisture or "priming." However, as the steam was of approximately the same moisture content for all tests, the "condensation" was proportional to the amount of steam used.

³⁷The condensation curve (liquor in digester gallons) in fig. 3, which is typical for most of the individual cooks in these experiments, also show a greater rate of condensation at the end of the cook than at earlier periods except during the first hour when the pressure was being increased. This can be accounted for only by the fact that heat other than from the steam alone, was supplied to the digester during the earlier stages of cooking. As the cooking reaction is most vigorous at the beginning, it seems probable that the heat supplied was heat of reaction.

³⁸It is evident that the effects obtained in the tests varying the initial concentrations are much less pronounced than would have been the case if the diluting effect of condensation had been absent. The autoclave tests for which data are given in Table 15, afford fairly conclusive proof of this.

³⁹These amounts were calculated by interpolating from the yield curves (fig. 4), the loss on bleaching curves (fig. 10), and the curves for soda ash and bleaching powder employed per ton of pulp (figs. 18 and 19), and not from actual test data. On this account platted points have been omitted.

⁴⁰Reasonable maximum, average, and minimum values for a "solid cook" of aspen larch, mill are \$14, \$2, and \$6 as determined from statistical reports received from a number of mills. Correspondence with pulp manufacturers brought the information that reasonable maximum, average and minimum unit costs as defined above may be assumed with a fair degree of accuracy as follows: For soda ash, \$1.29, \$1, and \$0.85; for bleaching powder, \$2.05, \$1.55, and \$1.10. These values do not depend upon market fluctuations alone, but vary through the range given, are largely to differences in freight charges for mills in different localities. The actual selling price of "58 per cent" soda ash is 10-48¢ greater than the manufacturers' or market quotations, since the latter are based on the old standard of "48 per cent" soda ash.

⁴¹See footnote, p. 37.

⁴²The more general statements in the summary will be found to coincide in a greater or less degree with previously existing opinions, a fact not surprising when it is remembered that the soda process has been carried on for half a century. On the other hand, satisfactory evidence and data substantiating these opinions have not been available. The present investigation affords such information, as well as a basis for more specific conclusions.

WILL MAKE BOXES AT VANCOUVER.

A new industry that will, when running to full capacity, employ 200 hands, will shortly be established within the confines of Greater Vancouver, according to Mr. J. R. Davison, industrial commissioner for Vancouver. Mr. Davison stated that an United States firm composed of Boston capitalists, manufacturing a patented wooden box, would, in February or March, locate on a site to be selected bordering on the Fraser River.

The company is capitalized at \$250,000, fully paid up, and will make from British Columbia timber a new style packing box, three-ply veneer, with varying thickness, air-tight and impervious to moisture, and will do a trade with Ceylon, India, Europe and the United States. British Columbia produces the particular quality of timber required for the cases.

Notes on Causticising

SINDALL and BACON

(1)—Recovered Ash and Lime.

The conditions which make for the efficient and economical handling of the processes by which paper making fibres are converted into pulp are now so well understood that it is difficult to suggest methods for improving them. Nevertheless a survey of the operations involved and a consideration of their mutual dependence will be of value to students and others who are not familiar with the detail, and who may be personally concerned in the necessity of getting the best results. This would apply particularly to those to whom has been given the charge of the plant, and who desire to know something of the theoretical principles underlying the technical practice demanded by any specific process. It is true that a high efficiency obtains in most mills using the soda treatment for esparto and similar fibrous materials, and mainly through the skilled work of the chemist in charge, but the ordinary text books do not give the average student just the information he needs when seeking to instruct himself as to the reasons why a certain method adopted in practice always gives a good result, or on the contrary a poor result.

The process of causticising recovered ash and soda is perhaps one of the most interesting as well as one of the most important in the manufacture of paper pulp, and forcibly illustrates the value of a knowledge of first principles.

The chemicals used are, recovered ash obtained from the residual liquors of boilings of raw material, alkali carbonate of soda required to make up losses in the recovery of soda, and caustic lime.

The first is a crude form of carbonate of soda derived from the combustion of the black soda liquors rich in carbonaceous matter dissolved from the original fibre. It varies considerably in composition containing active soda Na₂O from 48 per cent to 50 per cent according to the care exercised in the recovery process.

The second material is the comparatively pure commercial carbonate of soda, the composition of which is practically constant. The content of soda is 58 per cent Na₂O equivalent to nearly 100 per cent carbonate of soda, and unless the alkali has become wet by undue exposure to water this percentage may be relied on.

Since the carbonate of soda has no resolving action on raw fibre it cannot be used in the form of carbonate and its conversion into caustic alkali is the first step towards the production of a paper pulp. Hence the use of the third chemical caustic lime. This material is not of constant composition, some limes containing a large proportion of stone, others being imperfectly burnt in preparation, and all forms being liable to deterioration by exposure, owing to the absorption of moisture and carbonic acid gas from the air. The proportion of active lime CaO is therefore not a constant amount.

Table 1—Equivalent Weights of Recovered Ash.

% Na ₂ O	Tons	cwts	qrs	lbs.
48	100	0	0	0
46	104	6	3	23
44	109	1	3	8
42	114	7	2	6
40	120	0	0	0
38	126	6	1	7
36	133	6	2	18

Table 2—Equivalent Weights of Caustic Lime.

% CaO	Tons	cwts	qrs	lbs.
100	100	0	0	0
98	102	0	1	18
96	104	3	1	2
94	106	7	2	17
92	108	13	3	19
90	111	2	0	26

The effect of varying constitution of these chemicals is shown in the following tables:

Thus to get constant results in the process of causticising it is essential to make allowances for any serious variation in the composition of the recovered ash. In practice the method of production of the ash keeps the variation from day to day within very small limits, as will be shown later.

From Table 2 it will be noticed that in order to get the same amount of caustic soda from a recovered ash showing varying percentages of soda, different actual weights of the ash must be taken. Thus it will be necessary to take 120 tons of 40 per cent ash in order to get the same amount of caustic as that obtained from 100 tons of 48 per cent ash.

Similarly in the quantities of caustic lime used, the same attention must be given to the actual percentage of CaO. Thus 104 1/4 tons of 96 per cent lime will produce the same result as 109 tons of 92 per cent lime, other things being equal.

The losses which naturally occur in the recovery of the soda are made up by the use of fresh alkali or carbonate of soda, which is used in the proportions required according to the amount of ash recovered. Under the best conditions it is possible to recover 85.90 per cent of the caustic soda originally used. The remaining 15 per cent is lost in various directions as will be seen later when we come to discuss the actual recovery process, and this quantity has to be replaced by fresh alkali.

It is cheaper to use the alkali and causticise it together with the recovered ash than to make up the loss by using caustic soda purchased as such, since the cost per unit of active soda NaO is higher for caustic soda than it is for alkali causticised at the mill.—Paper Makers' Monthly Journal.

OTTAWA RIVER ABNORMALLY LOW.

Ottawa, October 5. — Not only is the low water of the Ottawa River causing some 1,000 men to idle about the streets of Hull just now, but it is also causing considerable anxiety to the firm of J. R. Booth. The serious question which now faces that company is where is the pulp coming from which is expected to keep their paper mills running.

It is learned that within a couple of weeks a large supply of 375 tons, which was stored early in the spring, will be about exhausted. While the mills were running early in the season a large quantity of pulp was stored for future use in the yards. In consequence of the war there has been an unusually heavy demand for newspaper, and consequently the big pile has been used up.

Mr. Jackson Booth, explained yesterday that unless the water in the river rises so that the firm can operate the pulp mills, which have been closed for nearly three months, pulp would have to be bought. This is a departure from the general custom, but he went

on to say that the paper mill would be kept running so long as there is any water at all in the river available for power.

Yesterday the river showed signs of rising, but the rise was not great enough to be of any use.

Mr. Booth explained that the water now was 18 inches lower than it should be, according to the agreement which the firm had with the government.

Every effort has been made to conserve the water so that the various mills may be run alternately, as the firm is very anxious to have the mills in operation.

At the present time some 1,500 men are working around the yards and mills. There are now more men than there is work for, but the firm is not willing to lay off any more than is absolutely necessary.

An employee of the firm who has seen 25 years' service, said that he had never seen such an unfortunate year as the past one has been. He declared that the firm as well as the men had suffered much loss by the mills being idle.

NEW LIFTING MACHINERY.

Two booklets descriptive of new machinery made by the Herbert Morris Crane and Hoist Co., Limited, indicate excellent progress in catering to peculiar needs of users of their class of products. Bulletin B9 describes a new standard overhead crane. Instead of running in the top of the rail, as is usual in overhead travelling cranes, the type "S6" is designed to run on the lower flange of two parallel I beams. These may be existing roof beams, or special beams simply attached to the roof trusses. What will immediately strike every practical man is the reduction of first-cost made possible by the elimination of the usual brackets.

Another feature is that the stresses on the structure itself are very much simplified. Sometimes the wall of a building would carry the crane, crane runway and load vertically, but it is too weak to resist the overturning effect of an ordinary crane carried on wall brackets.

Still another great advantage possessed by the type "S6" Crane is to be found in its ability to connect up with a Morris Overhead Runway. The combination is a source of much time-economy, as it eliminates many useless re-handlings of the load.

Bulletin Y17 describes the Morris Folding Tubular Steel Tripod. One feature which will appeal to contractors, structural engineers, stone workers and other users of this kind of lifting gear is the ability to fold up the tripod without removing any bolts or pins.

A broad flange is provided on each foot to enable the tripod to carry a load on soft ground, and a square point gives a good "grip" on harder surfaces.

Another new feature is the provision of a small pulley at the top of the tripod by which a small rope can be used to haul up the heavy lifting block or to handle very light loads quickly.

Every tripod is tested with a 50 per cent overload, so that the safety of the user is always assured.

It is also worthy of note that even in the one-ton capacity the tripod is light enough for one man to carry on his shoulder. Those who have had experience of hauling around the home-made wooden shear-leg will be able to appreciate this feature to the full.

WHO'S WHO IN THE PULP AND PAPER INDUSTRY

MR. GEORGE E. CHALLES

"Do you know Challes?" "Well, I should say that I do. He is the fellow that has such a great admiration for Hawkesbury Pulp," remarked a widely known paper manufacturer across the border when asked this question a few weeks ago. And George E. Challes, who for many years has been selling easy bleaching sulphite for the Riordon Pulp and Paper Co. of Montreal, from New York City to the Mississippi River north of the Mason and Dixon line, is perhaps the most widely-known Canadian calling constantly upon the trade in Uncle Sam's domain. He has always believed in the superiority of his product, talked it in season and out and so convincingly that the firm to-day dispose of the major portion of fifty thousand tons annually in the great market to the south, although never neglecting the requirements of their Canadian customers.



"The man on the road," for the company, he travels over forty thousand miles a year on the average and never misses a trip. There are few more conversant with the market situation, the sources of supply, manufacturing facilities, foreign shipments and statistical data than he.

Any mill supply man plays a decidedly important and influential part in the great paper trade of the country. He is the barometer of conditions, the library of knowledge and the storehouse of facts—for the selling end of any organization is the vital

force which keeps the industry busy and the workmen employed. For thirty-four years the subject of this sketch has been actively connected with the pulp and paper trade. That has been his hobby and life work.

Napawee is the capital of the united counties of Lennox and Addington, and it was there that Mr. Challes was born in 1857. After completing his education at the public schools and the Napawee Academy, as the upper school was then known, he landed his first job in a local law office, where he performed clerical work for five years. Then one day a vacancy occurred on the staff of the old Napawee Mills Paper Manufacturing Co., at Napawee Mills, now known as Stratheona, located about five miles up the river. He secured the position, and thus entered upon his first introduction to the business, being placed in charge of the mill supplies and attending to the correspondence. William Hanson, now of Hanson Bros., a leading financial firm in Montreal, was the salesman of the Napawee Paper Co., in Toronto. In 1882 he was appointed representative of the Travellers' Insurance Co., of Hartford, Conn., for the province of Quebec and another man had to be selected in his place. Mr. Challes was sent to Toronto to undertake the task and given charge of the warehouse at 114 Bay Street. The Napawee Paper Mills had three machines in those days. The widest was seventy-two inches and travelled at about one hundred and fifty feet per minute, which, when contrasted with the big Fourdriniers of the present time with a width of two hundred inches and over and speeding along at the rate of six and seven hundred feet every sixty seconds, affords some conception of the rapid advance that has been made in the art of producing news print. The output of the Napawee mills was about eight tons per day of news and semi-book papers. The industry supplied the Mail, Globe, Telegram and the World with paper which then commanded about seven cents per pound, being made principally from soda pulp and rags, the Napawee concern maintaining a soda pulp plant at Fenelon Falls, Ont. Gradually ground wood pulp and sulphite came into use which lowered the figure for the product until in the early nineties news print could be bought for about three and half cents. The Napawee paper Co. slowly found itself outdistanced in competition in material and output, and got into financial difficulties. The mills were eventually sold and went into another line of product.

It was about this time that Mr. Challes met his old and life-long friend, John R. Barber, the dean of the paper trade in Canada, one afternoon on the street, who suggested that his services be tendered to the Georgetown mills and the Riordon Pulp and Paper Co. Feeling that there was a good future in this connection, it was not many weeks later, in 1893, that Mr. Challes went on the road to sell the output of news print of the Riordon plant at Morriton, which was then about twenty tons per day, and to devote a portion of his time to handling the book papers made by William Barber and Bros. at the historic Georgetown mill. The Riordon Co. were not manufacturing sulphite in any quantity and the big pro-

position at Hawkesbury was an after-development. For some years Mr. Challes sold jointly for the Barber and Riordon, and when the latter branched out heavily in the sulphite fibre line in the late nineties, he devoted all his energies to their work. In the evolution of affairs the Riordon Company have ceased making paper of any kind, and now turn out fifty thousand tons annually of chemical pulp, being the largest producers in the British Empire at their mills at Hawkesbury and Merrittton.

The company have two sales managers, who have always worked together in harmony and unity—T. J. Stevenson directing the selling end from the head offices in Montreal, and Mr. Challes doing the traveling and keeping in close touch with the trade at all outside points. Spending fully three-quarters of his time on the road, the daily reports forwarded by him, are always complete and up-to-date.

A man of few hobbies, he knows the pulp situation thoroughly and intimately, and enjoys a continent-wide connection with the trade, having come in close contact with practically all the book, writing and bond paper manufacturers in America. A large portion of his time is spent in interviewing manufacturers across the line, and he never fails to uphold Canadian institutions, industries and policies. On any matters of international importance to the trade he expresses his views frankly and fully, and has thus gained the respect and esteem of all with whom he does business. A resident of Toronto for thirty-two years, he is one of the veteran representatives on Bay Street, where he has had a warehouse or office for this long period.

His views on the sulphite situation at the present time are interesting, due to conditions arising from the war. "Yes," he said, "owing to the shutting off of European supplies, which came to America at the rate of about eight hundred tons a day and the shipments on the docks, which have been cleaned up, there has been a natural stiffening of prices. Canada furnishes the United States about seventy thousand tons of sulphite each year and, after the outbreak of hostilities, there were numerous anxious inquiries from all over the land asking us to furnish enormous quantities at short notice, but our product is pretty well contracted for, and we protect all those whom have been our customers for years. It has always been the policy of the firm to safeguard the welfare of its patrons in every way, and no advantage is being taken of present state of affairs. Naturally there has been an advance of a few dollars, but contracts for a long term cannot be entered into. No one can guarantee prices for any extended period under present circumstances. What the future will bring forth no man can tell. It depends largely upon the length of the strife, water conditions and domestic quantities that can be obtained. I understand that Swedish mills have closed down partially, and that most of their product has been bought up. There may be a shortage in January or February next, but those in intimate daily touch with the trade are disposed to view the future dispassionately and future figures will be determined entirely by the law of supply and demand."

Mr. Challes is a director of the Abitibi Power and Paper Co., whose new mill at Iroquois Falls is now turning out about one hundred and seventy tons of ground wood pulp per day, and a news print mill is under construction which will produce 250 tons daily when in operation. Fraternally, he is a member of

Queen City Lodge, Independent Order of Foresters, Rehoboam Lodge, A.F. and A.M., Cyrene Preceptory and Rameses Temple, Mystic Shrine. Occasionally he does some curling in the winter with the Queen City Club, and in the old days played a pretty fair hand at billiards, but his interests are such that when at home he prefers to spend his time at his own fireside, enjoying a quiet smoke, the daily news and trade press, of which he is a diligent reader.

NORWEGIAN PAPER AND WOOD PULP.

"Farmand" says, September 19th. "The shipments of cellulose to America have been and still are enormous. At present the market for cellulose is quiet, but very firm."

After the large shipments which were made to U. K. after the navigation was reopened the enquiry from that country for mechanical wood pulp has subsided.

A maker of mechanical pulp told us that on Wednesday he received a telegram from a papermaker at Ghent, Belgium, asking if it was possible to charter and the freight and war-risk insurance will certainly be high. Other exporters told us that they had likewise had enquiries from France. The pulp situation will soon be changed, if France and Belgium resume their importations which have been quite stopped since the outbreak of the war.

It is customary that the boards of directors of the Norwegian and the Swedish Wood Pulp associations meet from time to time to discuss matters. This week the Swedish board has been to Christiania. We understand that the two boards considered the situation for mechanical wood pulp on the whole as very good. The Upper Gulf mills have contracts with French paper-makers and owing to the uncertainty of France, being able to take these parcels, there was a little nervousness, as these mills are obliged to ship within the close of navigation. It would help them considerably, if they were able to ship in Norwegian vessels, but the Swedish State does not undertake war risk insurance of goods except on Swedish keels. Efforts have been made to get the Norwegian Krigsvareforsikring to insure Swedish wood pulp in Norwegian vessels and this has been arranged.

DROUGHT TESTS FOREST FIRE PROTECTION PLANS.

The efficiency and resources of all forest-protective organizations in Canada have been put to a severe test this year by the prolonged drought which prevailed throughout the greater portion of Canada during the early part of August. It seems probable that 1914 will be recorded as the worst fire year since 1910. The situation in Southern British Columbia has been very serious, and great areas have been burned over in Alberta, on the east slope of the Rocky Mountains. Northern Ontario has suffered severely.

The railways are no longer the chief source of forest fires, and the necessity for a stricter control of the setting of fires by settlers for clearing land is becoming increasingly apparent. Also, in many sections, especially on cut-over lands, where most of the fires originate, the establishment of a more adequate patrol system is essential to protect young growth and prevent the spread of fires into old timber. The extension of the merit system in the appointment of fire rangers in the services of both the Dominion and the Provincial Governments is necessary if the best results in fire protection are to be secured. Clyde Leavitt, in *Conservation*.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

FROM OUR LONDON REPRESENTATIVE

To pay a visit to most of the British paper mills, one could hardly realise that we are at war with the "Fatherland," and that we are also in the midst of one of the greatest wars ever experienced in the world's history. Thanks to the British Navy, there are plenty of raw materials in stock, and every day shipments from Scandinavia and Canada are arriving at the principal ports. Compare this state of affairs with Germany and Austria. In Germany, all the newspapers are cut down to the barest minimum, and there is a scarcity of paper owing to mills having to be closed in order that the army may get all the available men. All the newspapers that I have seen lately in London from Germany show that things are in a crucial condition and numerous advertisements have been replaced by notices mourning the loss of relatives killed or wounded in the great European struggle for supremacy. The loss of these advertisements, of course, will tell against the revenue of newspaper and indirectly the paper mills will suffer. In Austria-Hungary there is the same story to tell—in fact the Austrians are in a more strained position than the Germans. Paper-making is also difficult to carry out in France, but in Finland the pulp and paper industry, while still existing and exporting fairly large quantities, has experienced some difficulty owing to the scarcity of labour. Italy is now reported to be short of sulphite and sulphate for her mills, and the Norwegians and Swedes are troubled with low water in their rivers (which must necessarily reduce the output of mills) and the shipping question. However, shipments from Norway have up to the present time been fairly regular, but at times there is an uncertainty about the arrivals from Sweden. In all cases, Swedish and Finnish pulp and paper have to be carried by neutral ships, but the insurance against war risk has been considerably reduced which adds greatly to shipping movements. So that taking a survey all round, the British, Canadian and the American mills are having a peaceful time for the carrying out of pulp and paper manufacture and between them they should capture a large portion of the markets where the Germans and Austrians have had a good footing. Numerous enquiries are being made in Scandinavia about sulphite and sulphate, owing to the falling off of the German supply, but so far as I can learn, very little business has been transacted with the States.

Prices Firm in England.

Though raw materials have got over the war panic by now, prices of papers in England have not been reduced. Newsprint is changing hands at 3 cents to 3½ cents per lb. and nearly every decent newspaper is laying in stocks which cover hundreds of tons. Mills making newsprint are consequently running full capacity. In order, classes of papers such as art, tinted printings, writing papers, banks, wrappings, etc., mills are busily engaged. In thin papers, such as thin arts and thin printings, etc., Germany was a good supplier and no doubt there may be in the near future a shortage in the supply of these cheap commodities. There is also likely to be a shortage in paper for photographic purposes, as the French mills have their

staffs serving in the war. Water conditions prevent photographic papers from being made here in England—at least that is the contention—an consequently the French and Germans had all the trade. Prices of all fine and colored papers are still on the higher basis, and will keep so.

The Supplies of Pulp.

Since the second and third week in September, British mill owners have been purchasing large supplies of sulphite and sulphate. The demand towards the end of September fell off somewhat, so that only small parcels are changing hands at prices which are on a high basis, owing to the cost of shipping, insurances, etc., which usually arise in war time. In my last despatch to the Pulp and Paper Magazine I gave the total imports of pulps for August. Since the end of August the arrivals up to the third week in September, the latest figures issued by the Custom House to me, are as follows:—Chemical (bleached) dry, 1,368 tons; chemical (unbleached) dry, 48,822 tons; chemical, wet, 1,530 tons; groundwood, dry, 550 tons; groundwood, moist, 54,550 tons. This is practically three weeks' supply of pulps. On new business, cash was against documents. Of the totals, Canada supplied about 13,000 tons of ground wood and Newfoundland about 4,000 tons, the rest mostly coming from Norway. Prices in London may be quoted in or about the following region, ground wood being much cheaper:—Sulphite bleached No. 1 \$65 to \$72; easy bleaching, \$50 to \$52; "news" or strong quality, \$46 to \$48; unbleached soda (No. 1) \$46 to \$48; kraft, \$46 to \$47; groundwood, moist, \$10.60 to \$12; groundwood, dry, \$24 to \$25.

Prices are still London and other British ports. In Scandinavia reports are current that the low water is materially affecting the output of the pulp mills, and prices are inclined to reach a higher level. German and Austrian pulp mills are practically closed, owing to the scarcity of labor.

Esparto is arriving in small quantities, and prices are very high. In fact, stocks of esparto are very small. A good trade is being done in rags, and prices have advanced all round for all grades.

Chemicals and Fillings.

In the chemical markets business is not so brisk. Alkali companies are doing very well, so much so that the ordinary £1 shares in the United Alkali Company have advanced 100 per cent since the end of August. In many respects the chemical trade in England is receiving a great stimulus by the elimination of German competition and better prices are being secured. The slight set back at present is not due to dullness in paper trade, but to the low state of the cotton industry. Bleaching powder can be bought in spot lots at \$34. caustic soda, 77 per cent, at \$24.50, 76 per cent at \$24 and 60 to 62 per cent at \$24 to \$25. Sulphur is scarce and rosin is plentiful and cheap. In fillings, china clay contracts can be made with considerable concessions. The output is reduced as the demand has been reduced. Mineral white is getting very scarce and large supplies of terra alba are being used in place of French chalk.

Pulp and Paper News

G. A. Howell, Toronto, has returned from an extended business trip through Ohio and other middle-west states. He reports that the paper mills are fairly busy and are looking forward to improved conditions.

As soon as the Transcontinental railway is running and reasonable freight rates obtained, many outside buyers of pulp wood are expected to go into New Ontario and widen the market for the settlers' timber. The New Ontario Colonization Company, of Jacksonboro, Ont., are going ahead with the building of roads and the erection of houses and carrying on their plans of development in the way of making preparations to promote settlement and, with the sale of pulp concessions, other expansions industrially and agriculturally may be expected in the near future. Hon. W. H. Hearst, the new Premier of Ontario, who is retaining the portfolio of Lands, Forests and Mines, which he has ably filled for the past three years, in an address to the people of the province has pointed out that stock is now being taken of the value of the natural resources of the province, particularly of timber and pulp wood from which a very substantial portion of the revenue of Ontario has been derived in the past; and it is expected that at an early date the province will have as complete information as possible with reference to its natural resources so that the Government may be the better able to determine the value of these resources from a revenue producing standpoint for the future and the best means of conserving and dealing with them to secure the most beneficial results.

Manley Chew, of Midland, formerly Member of Parliament for East Simcoe, has purchased from the Ontario Government thirty-six square miles of fire-swept and damaged timber at \$8.50 per thousand feet and two dollars timber dues.

The Abitibi Power and Paper Co. are now turning out about one hundred and seventy tons a day at their ground wood plant at Iroquois Falls and are preparing to take out great quantities of pulp wood during the coming season. A town site is being laid out, and a sewerage and waterworks system installed, while houses are being erected for the workmen. Good progress is being made on construction of the new paper mill which, it is expected, will be in operation by May or June next and will have an output of about two hundred and fifty tons per day.

The Canada Paper Company has sent out to the trade a neat card, printed in red and blue on coated litho blanks, six ply, bearing the motto "Business as Usual." Attached to the card is a slip printed in blue, on grey tinted art paper, suede finish, reproducing a short editorial from a Toronto paper on the advisability of adopting and living up to the motto during the progress of the war.

The Don Valley Paper Mills, Toronto, are turning out several new cover papers known as Thorncliffe Covers, which come in buff, lavender, wattleau, platinum, violet blue, Nile green and shrimp. Like many other paper firms, the company are now featuring on all their samples the words "Made in Canada."

The provisions of the Ontario Workman's Compensation Act will come into effect on January 1st next. An order in council has just been passed extending until October 31 the time in which manufacturers must file lists of employees and pay rolls with Commission who are now holding regular sittings in order to get matters into shape.

Ottawa Notes

Ottawa, Ont., October 10.—The low water situation has now reached an acute stage in Ottawa. The water is now within an inch or so of the lowest record known since 1858 and as a result the E. B. Eddy Company, Ltd., has been forced to close down two of its paper mills, throwing 112 men out of work.

The officials of the company state, however, that they are determined to do as much as possible to give employment to their men and with this in view have planned to operate their pulp and paper mills alternately. It is impossible to run both at the same time as the water has reached such a dangerously low level. However, the pulp mills will be run for a time and the paper mills then kept going with the supply thus produced and so on. The water is now lower in the Ottawa than it has been since the company was first established over half a century ago, with the exception of one year.

The J. R. Booth Company, which some time ago had to close down its saw mills as a result of lack of head at the Chaudiere, is still doing its best to keep its pulp and paper mills going but there is of course the prospect that if conditions do not improve it will have to further curtail its operations in this respect.

Some \$5,000 worth of lumber of different kinds was destroyed last week in a fire in the lumber yards of the Gilmour and Hughson Company at Hull. Only able work by the Hull fire brigade prevented a conflagration which would have burned the millions of feet of saw lumber and pulpwood in the yards. As it was about 150,000 feet of lumber was destroyed.

Local newspapers which scattered extras broadcast at the beginning of the war are beginning to curtail these editions somewhat and the size of regular editions is also being cut down. As these conditions are according to report being duplicated in many other Canadian cities it is being anticipated that the somewhat extraordinary demand for news print for extras which was a feature at the beginning of the war will drop somewhat. However, on account of the stoppage of the American supply of Norwegian pulp it is believed that the United States will supply a demand greater than Canadian mills can fill quite apart from home consumption.

In spite of the attractive market for Canadian pulp and paper presented by the present situation the outbreak of war has put a stop to the incorporation at Ottawa of pulp and paper companies, formerly so active. Scarcely a single company of this kind has received letters patent in the last three months where formerly they were being organized at an average of one per week.

The Canadian Trade and Commerce Department is being flooded with inquiries from Europe for Canadian pulp and paper products. Recent inquiries of this kind related to the procuring in Canada of printing, wrapping and every other kind of paper used in the manufacture of stationery, sandpaper, pulp, leather, board, pulpboard, etc.

MAC.

CANADIANS HONORED.

Mr. J. B. White, manager of the woods department and sawmills of the Riordon Pulp and Paper Co., has been appointed a member of the Forestry Committee of the American National Wholesale Lumber Dealers' Association for the ensuing year. The other Canadian member appointed to this committee is Mr. John S. Gillies, of the Gillies Lumber Company, of Branside, Ont.



UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The Taggart Paper Company of Watertown, N.Y., has been placed on the so-called profit sharing plan. Eight of the old employees who have been associated in the paper-making business for a quarter of a century, and whom have been important factors in helping the company to make money, will become stockholders. The company will continue to be conducted under the direction of Geo. C. Sherman, and will be increased from a \$100,000 to a million dollar corporation. The company owns and operates two mills, one at Felts Mills, and the other at Great Bend, N.Y. Newsprint is turned out at the rate of over thirty-five tons daily, and this will be largely increased in the future. To this end the company is preparing to build a new dam on the Black River for more power.

Mr. Sherman has been secretary and treasurer of the Taggart Paper Company for twenty-six years. He succeeded the late W. W. Taggart, while D. M. Anderson had for many years been president of the company. About a month ago, Mr. Sherman purchased Mr. Anderson's interest and is now president. His daughter, Mrs. Katherine Sherman Fox, is vice-president, and J. Victor Baron is secretary and treasurer. Through Mr. Sherman's benevolence, none of those taken into the company will be forced to advance a dollar. Each receives a big slice of the stock, the total being something over one-half of the entire amount, so that although Mr. Sherman is the main stockholder, the control goes to those who now become members of the concern. The profit year by year will be applied in paying each man's share. On the other hand, this deal provides an unquestioned source of revenue for Mr. Sherman's family in case of his demise, and at the same time shifts from his shoulders a large amount of active responsibility.

Harry Gould, of Lyons Falls, N.Y., whose name has been mentioned as the probable successor of D. M. Anderson, as general manager of the St. Regis Paper Company, will not be named to the position. One of the officers of the company made this statement last week, and supplemented it with the information that the position is still vacant, and is likely to remain so for some time to come. While Mr. Gould is regarded as one of the most capable men in the paper-making industry in northern New York, he is a man of wealth, and would prefer to remain at Lyons Falls in his present capacity in connection with the G. H. P. Gould interests.

Maine paper manufacturers, in common with lumber interests, will not cut as much timber during the coming year as last. Fred A. Gilbert who is in charge of the spruce wood interests of the Great Northern Paper Company says that he has been instructed by the President, Garrett Schenck, to cut 80,000,000 feet of spruce this year. Last year, this company cut 120,000,000 feet on the Penobscot and Kennebec River waters. Vice-President N. C. Ayer, of the Eastern Manufacturing Company, stated that his company will probably not cut as many logs this year as last on account of the dull condition of the lumber market. The demand for

paper is strong, and the company has an average supply of pulpwood on hand.

The American Box Board Company, of Grand Rapids, Mich., which has just completed the erection of a big new plant, has taken over a fibreboard plant located in Battle Creek, Mich., and is moving the plant to the new structure erected in Grand Rapids. Practically all of the employees who worked in Battle Creek will go to Grand Rapids to work in the new plant.

The Colin Gardner Paper Company, of Middletown, O., is installing a new power plant. The plans for the plant involve quite an improvement. The foundations are already in on the strip of ground between the Miami River and mill race. The plans and specifications for the boilers and stacks will be ready in a few days, when the work of installation will be rushed to completion.

Walter E. Byrne, formerly with the Union Bag and Paper Company, at Kaukauna, Wis., but who some time ago took a position with the company at Roanoke Rapids, North Carolina, has been transferred to Thorold, Ontario, and is now in the employ of the Beaver Company, Ltd.

The J. H. Horne and Sons Co., of Lawrence, Mass., is loading for shipment the large 160-inch machine built for the Brompton Pulp and Paper Machine Co. of East Angus, P. Q. This is the largest machine that has been built in Lawrence. It has 40 four-foot dryers, 3 presses and a 75-foot fourdrinier with adjustable pitch. This company is also building beaters and Jordans for the same mill.

The Allen plant of the Union Bag and Paper Company of Glens Falls, N.Y., was obliged to suspend operations last week owing to lack of water. The stream is nearly as low now as it has been at any time during the summer. A heavy rain is needed to keep the manufacturing plants humming.

The Mountain Mill Paper Company has a gang of men at work on their newly purchased Forest mill. The big wooden water wheel, which has been buried in rubbish for 25 years, has been dug out and experts say it is as good as ever. This wheel is quite noted. It was placed in the mill by Benton and Garfield nearly 50 years ago, and was one of the biggest wooden waterwheels in any of the seventeen mills then in Lee, Mass.

Fred J. Motz, for the past few years manager of the Wabash Mill of United Paper Board Company, has been appointed manager of the Wabash Coating Mills, of Wabash, Ind., and will in the future look after the affairs of both plants. Mr. Millsbaugh, former manager of the Coating Mills, will devote his time to the purchase of straw for the United Paper Board Company, and will also be engaged in the sale of United products.

Advices received in the East from San Francisco, Cal., tell of the purchase of all of the properties of Crown-Columbia Paper Company and the Williamette Pulp and Paper Company, following the organization of the Crown-Williamette Paper Company with a capitalization of \$13,000,000. William Pierce Johnson is the president of the Williamette Company, and it is more than probable that he will be the president of the new company, and that Louis Block, of the Crown-Columbia Company, will be the vice-president and general manager. Some of the new eastern capital may be represented among the officers. The combination, it is announced was in the interest of economy, and to meet the competition of Scandinavian and Canadian mills, which have been active in Pacific Coast markets since the removal of the tariff. W. P. Johnson is now in the East on business connected with the new proposition. The daily capacity of the various plants of the new company is in excess of 450 tons of print paper, wrapping paper for citrus fruit, and paper bags. The principal plants of the companies are at Camas, Washington, Oregon City, Ore., and Floriston, California. Plants for printing citrus wrapping paper are maintained at Los Angeles and at Sanford, Florida.

News was received at Fulton, N.Y., last week that the Canadian creditors of the Battle Island Paper Company have no particular objections to the sale of the timber lands and roasting plant. The Ontario Paper Company is bidding for the Canadian plant and timber, and in case the sale is made it is understood that Judge Ray will allow the sulphate mill north of Fulton to open. Enough wood to run the plant for a few weeks is already on hand, and more can be obtained. Fires have been kept in the boilers so that the digesters would not deteriorate, and with many modern improvements added in the last few years, the mill is considered one of the best in the country.

What promises to be a large and very influential organization for the industries of New England in their fight for equitable freight rates and demurrage charges is the newly-formed New England Industries Demurrage Committee. The Executive Committee of this association is composed of fifteen members representing New England Chambers of Commerce, and among the paper manufacturing representatives on the committee are F. H. Babbitt of Robertson Paper Company, Bellows Falls, Vt.; D. W. Linton, of the Berlin Mills Company; C. H. Tiffany, traffic manager New England Paper and Pulp Traffic Association, and P. J. Dowd, of the Hamden County Traffic Association of Holyoke, Mass.

The paper laboratory of the Department of Agriculture at Washington is now testing out a new machine to measure the translucency of paper, which has just been completed by the inventor. It is said at the laboratory that the new venture seems to do all that is claimed for it.

The Chemical Paper Company of Holyoke, Mass., has awarded the contract for an addition to its plant. The construction work of the building was started on October 6 and the work of erecting the building will be pushed forward rapidly. Owing to the steady increase in business at the Chemical Paper Company, it was found necessary to erect a large addition to their No. 3 mill, and with the completion of this new mill the concern will be in a position to accept much more business.

The Remington-Martin Paper Company of Watertown, N.Y., will shortly, it is expected change its name to "Remington Paper and Power Company." At a meeting of the reorganization committee held in New York last week the plans of reorganization evolved this plan. It is stated that much progress has been made and that within a short time the companies will be operating under the new plans. The committee has practically decided upon Mark S. Wilder, who has met with much success in his capacity as receiver, and his well known ability as a successful paper manufacturer leads the committee to the hope that he may see his way clear to accept the management of the company when the reorganization is completed.

U.S. STATISTICS.

From the statistics compiled by the American Paper and Pulp Association it will be seen that the paper manufacturers of the United States showed some conservatism during the month of August when there was a state of panic in the trade at large. The board mills alone had any over-production. Newsprint mills showed a tendency to conserve their raw material supplies by running only on contract orders and thus the production tonnage fell off. Shipments, however, were 103 per cent of the actual output. The reports show that 88,257 tons of news were made in August, and 90,632 tons were shipped. At the first of September there were 48,427 tons of news on hand, or about ten days' supply.

The reports from wrapping paper manufacturers showed that mills ran on better time during August than any other month in the year. In the twenty-six working days, the mills reporting produced 47,536 tons, and shipped 50,526 tons or 106 per cent of their actual production. Only 28,859 tons were on hand at September 1.

The board mills reporting produced 66,688 tons or about 79 per cent of their normal output for August. Shipments were only 65,769 tons leaving a tonnage of 16,048 on hand at the end of the period.

BIG DEAL IN MAINE.

Special to Pulp and Paper Magazine.

Bangor, Me., October 9, 1914.—One of the biggest transactions in the paper industry of America occurred last week when the Eastern Manufacturing Company of this city bought out the Katahdin Pulp and Paper Company of Lincoln, Me. There has been no mention of the price paid, but it is rumored to have been a very high figure.

The Eastern Manufacturing Company makes a specialty of medium and low grade writings, bonds and envelope papers and has a daily capacity of fifty tons at its mills in South Frewer, Me. Rag and sulphite papers are made by them.

The Katahdin Pulp and Paper Company makes a specialty of manilla envelope and white sulphite specialties. The pulp mill has a capacity of 45 tons daily, and the company has made high bleached and unbleached sulphite in considerable quantity over its own needs for paper making. The paper mill capacity is about 30 tons a day.

Much interest is shown among paper men in this section in regard to the future operation of the Katahdin mills as it is generally known that the Eastern Manufacturing Company has been contemplating some plant extension in order to take care of its customers.

The directors and officers of the Eastern Manufacturing Company succeeded those of the Katahdin Pulp and Paper Company immediately.



The Markets

CANADIAN MARKETS

There are practically no new developments in the pulp and paper field with the exception that conditions are now settling down to a more normal basis. News plants are well employed and running to capacity. Contracts with a number of publishers will expire in a few weeks and, when renewals come up, it will then be seen what figure news print will touch. Some sales managers are talking of obtaining quite a bit over two cents at the mill. Generally speaking publishers are still cutting down the sizes of their paper and issues, which formerly ran sixteen to twenty-four pages a day are now twelve, thirteen and eighteen. This is caused by the fact that advertising is still very low with most dailies for the fall season. Book and writing plants are beginning to feel the effect of the war and most of the machines are running only five days per week. Trade papers and weekly periodicals which have used much book paper in the past, are reducing reading matter and it is estimated that the demand is lessened by at least fifteen per cent if not more. Catalog houses and mail order firms are not sending out as much literature and this too, has caused a falling off.

English representatives of import houses have been in Canada during the past days interviewing certain paper firms with a view of securing high class book, bond and ledger papers in case anything should happen their own plants and to replace certain kinds of paper that have been imported heretofore from Germany.

One thing noticeable about the news print turned out now by a number of mills is that it has a creamy color where it was formerly bluish white. This is caused by the fact that the stocks of ultra marine are running very low and the color cannot be obtained any longer from abroad. There has been an advance of about ten per cent on all heavy colored papers owing to the advances in aniline dyes. In some cases the increases have been very sharp, and the manufacturers do not know where their future supply is coming from.

It may be stated that if the market were at all firm there would likely be an advance of a general character in book and writing papers. Some mills, whose contract for sulphite pulp, has expired are paying several dollars a ton more for the product and can only get quotations covering a month as the chemical pulp plants are taking every step to safeguard themselves but they have not made exorbitant increases. They are doing everything in their power to keep down the figure and protect customers. Many contracts will expire at the end of the year and then there may be a decided advance in book and writing quotations.

Ground wood pulp holds firm in price although the number of inquiries has fallen off. Some concerns are reported to be getting as high as \$18 per ton at the plant but generally speaking quotations remain from \$22 to \$25 delivered, while sulphite holds firm around \$45 to \$48 per ton delivered. Envelope manufacturers have all withdrawn quotations but there has been no raise in prices except on lines made from imported stock. Plants are only fairly busy. Kraft has been advanced about five to ten per cent, depending on quantity and

wrapping papers hold about the same. Jobbers are disposed to feel their way and are not loading up. In fact, stocks in some wholesale houses are reported quite low. The turnover during the past month has been equal in most cases to last year while a few firms had a small increase. Glazed paper for covering shoe boxes, hat boxes, etc., is in good demand and one mill, making this coated stock, which is run through friction calendars, reports a splendid demand from paper box manufacturers.

Canada last year imported from Germany in kraft, glazed and other lines of paper about \$350,000 while finished products, parcels and packages came in to the value was \$160,000. Now that German importations have been cut off, several box and paper firms are jumping into the breach and filling these demands. Parchment papers, glassine, glassine, onion skins, etc., have been advanced by jobbers about twenty per cent. One Canadian mill is conducting experiments in making grease proof paper and may put this product on the market before long.

The rag and paper stock is in good demand. There is fair activity in hard and soft white shavings but changes in prices in other commodities are few. Manila rope has taken a slump.

Quotations f.o.b. Toronto are:

Paper.

News (rolls), \$2.00 to \$2.10 at mill, in carload lots.
News (sheets), \$2.10 to \$2.25 at mill, in carload lots.
News sheet, \$2.25 to \$2.75, depending on quantity.
Book papers (carload), No. 3, 3.75c. to 4.25c.
Book papers (ton lots), No. 3, 4c. to 5.50c.
Book papers (carload), No. 2, 4.25c.
Book papers (ton lots), No. 2, 4.50c. to 5.25c.
Book papers (carload), \$4.75 to \$5.25.
Book papers (ton lots), No. 1, 5.25c. to 6.00c.
Writings, 5c. to 5c.
Sulphite bond, 6 1/2c. to 7 1/2c.
Grey Browns, \$2.35 to \$2.75.
White, \$3.35 to \$4.00.
Manila, B., \$2.85 to \$3.25.
Manila, No. 2, \$3.10 to \$3.50.
Manila, No. 1, \$3.35 to \$4.00.
Unglazed Kraft, \$3.90 to \$4.75.
Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood (at mill), \$16 to \$18.
Ground wood, \$22 to \$25 delivered.
Sulphite (unbleached), \$46 to \$50, delivered in Canada.
Third sand blues, \$1.60.
Sulphite (unbleached), \$48 to \$50, delivered in United States.
Sulphite (bleached) \$58 to \$60.
Sulphite (bleached), \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings \$1.95, f.o.b. Toronto.
No. 1 soft white shavings, \$1.85.
No. 1 mixed shavings, 55c.
White blanks, \$1.05.
Heavy ledger stock, \$1.50.

Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 90c.
 No. 1 Manila envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c to 47½c.
 Over issues, 55c.
 No. 1 clean mixed paper, 35c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$6.25.
 Black overall cuttings, \$1.75.
 Black linings, \$1.75.
 New light flannelettes, \$5.25.
 Ordinary satinets, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manilla rope, 3½ to 3 3/4c.
 No. 1 burlap bagging, \$1.00 to \$1.05.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5½c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7½c.
 Sulphite Bond, 6½c to 8½c.
 Writing Manilla 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper 5½c. to 7c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, 3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to 45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$215 to \$16.
 Ground wood, No. 2, \$22 to \$21, delivered United States.

NEW YORK MARKETS

New York, N.Y., October 12, 1914.

There has been a strengthening of the ground wood

market as certain Canadian and northern New York mills have made inquiries for rather large consignments of pulp during the interval. Prices have stiffened and grinders having agencies in New York have very little pulp available for immediate shipment. Most of them are tied up with contracts extending from November 1 to January 1. All are firm in the quotation of \$17.50 to \$18.25, f.o.b. ground wood mill.

The sulphite situation has shown some tendency to weaken under the indifferent attitude on the part of paper mills. Domestic sulphite has maintained a firm tone, and delivered prices ranged from \$46 to \$50 for No. 1 unbleached.

Rags and bagging of foreign quality and packing have been scarce, but some small shipments arrived at domestic ports in neutral ships and eased the situation somewhat. Domestic rags reflected a quiet tone, but prices remained unchanged.

There is a scarcity of hard white shavings, as all available supplies are moved as rapidly as baled. There are likewise no accumulations of soft whites, as some of the low grade sulphite paper manufacturers have been using large quantities of old papers to conserve their sulphite pulp supplies. Old Manillas and kraits remain in good demand, and scarce. Prices on No. 1 old Manillas ranged from 1.05c to 1.15c a pound and old kraits held stiff at 1.35c. Mixed papers eased off considerably under a falling off in demand and the prevailing quotations during the last week has been about 35 cents a hundred weight.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2½ to 2¼ f.o.b. mill.
 Unbleached Sulphite, impt., 2.25 to 2.45, ex dock, New York.

Bleached Sulphite, domestic, 3c to 3.35c.
 Bleached Sulphite, impt., 3.00 to 3.55, ex dock, New York.
 Easy Bleaching, impt., 2.75, ex dock, New York.
 Unbleached sulphate, impt., 2.25 to 2.35, ex dock, New York.
 Bleached sulphate, impt., 2.80c to 3.00c, ex dock, New York.
 Kraft Pulp, 2.20 to 2.30 ex. dock, New York.

Paper.

Amongst jobbers there was reported a fairly quiet market during the interval. That stocks of practically all grades are low is not denied, as jobbers have found it practically impossible to stock up under the firmness of the manufacturers' policy to deliver nothing but orders for immediate supplies. Mills reported fairly good running time during the interval. Some have been held up for several weeks on deliveries, while others are in a position to deliver immediately. There has been a heavy consumption of newsprint on contract roll business, as business with the publishers has begun to show improvement and larger circulation in all papers is reported. Transient business has been quiet, but values are about \$2.00 a ton higher than before the war began. There is a steady demand for sheets at 2.25c f.o.b. to New York. Side runs have been in good demand at 2.25c f.o.b. New York, and are now a little more plentiful. The book paper situation has shown slight improvement, and some western mills have advanced prices on cheaper grades about ½c a pound. Wrappings have eased off considerably in demand, but prices remain unchanged. Most demand is spotty. Kraft papers have been held

ing up fairly well at 3¾c. The tissue market reflected a healthy tone and prices are high. No. 1 whites and Manillas enjoy a fair demand at 47½c a ream. Colored is in quieter tone, but prices are quoted between 55c and 60c. The bag business has shown a little quieter tone, but values are firm. Boards are quiet, but prices have stiffened.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13¾c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manilla jute, 5½c to 5½c, delivered.
 Manilla, wood, 2.75 to 3.25, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$30 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.

Wood pulp board, \$42.50 per ton, delivered.
 Tissue, white, cylinder, 47½ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

IN SWEDEN.

Affarsvarlden says, September 16, of the Swedish wood pulp trade: Mechanical pulp: No sales of any importance have been made during the past week, but buyers have made very urgent calls for deliveries on old contracts. Prices are unchanged.

Chemical pulp: As mentioned last week British papermakers had bought very large parcels for prompt delivery, especially strong sulphite, but during the last days they have bought a further 10,000 tons at unchanged prices, viz., Kr. 160:— 165:—clear net fob cash payment for strong sulphite and about Kr. 175:— clear net fob for easy bleaching sulphite. Some sales have also recently been made to the United States of America of bleached sulphite at prices of Kr. 225:— 230:—clear net fob.

Of sulphate only very small parcels are in the market for prompt delivery, as the new mills are not ready. Prices for prompt are about Kr. 145:—clear net fob cash payment, and such parcels as may be available are meeting with a strong demand especially from America.

The employees of several wholesale paper houses in Toronto have donated an entire day's pay to the Canadian Patriotic Fund. The employees of the mills of the Laurentide Co., at Grand Mere, Que., recently gave one day's wages which amounted to about three thousand dollars.

CANADA'S PULP AND PAPER TRADE.



Imports of Paper and Manufactures in Dollars, 1874 to 1914 (Year ends in March).



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PULP ENOUGH TO SUPPLY THE WORLD—Now is the time to secure your supply of pulp for the next ten years and avoid the possibilities of higher prices. Inquiries invited. Address, F. E. R., 404 King's Hall Building, Montreal, Que.

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A Semi-Monthly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades.

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MONTREAL, NOVEMBER 1, 1914

No. 21

DO WE NEED MORE MILLS?

According to the London correspondent of the Pulp and Paper Magazine, whose contribution appeals in a later page, Lieut.-Col. the Hon. P. Pelletier, Agent-General in London, for the Province of Quebec has been making public the wonderful resources of the Province, with a view to interesting English capital in pulp and paper enterprises. The statement attributed to Col. Pelletier is:—

"The present time also offers rich rewards to anyone who will establish paper and pulp mills in Quebec. The existing plants are unable to fill the orders they have on hand. There is abundant supply of cheap water power available—in fact, in some cities it is practically given away to new companies who will establish bona fide industries." Beyond this our correspondent gives us little information. It is to be hoped that the Provincial authorities will add to their excellent and constantly-growing knowledge of the natural resources of their domain, a thorough study of existing plants and the markets. Undoubtedly pulp and newsprint are in demand at the present time, and certainly the forests and waterpowers of Quebec will ultimately be united in such a way as to make Canada the leading pulp and paper factor in the world. The only question is, is it true that there must therefore be an immediate development in the industry in the way that the Agent-General indicates, i.e., by the establishment of new plants? The forest industries of Canada have suffered badly in the past from over-development, and questionable flotations. It would indeed be a pity if by well meant enthusiasm insufficiently advised, one of our own loyal representatives should incur any risk to British capital or to Canadian industry.

LITERATURE WANTED.

The Forest Products Laboratories of Canada are making a special effort to make as complete as possible their collection of books, bulletins, pamphlets and other literature on pulp and paper, and on forest products in general. An excellent start has already been made and those books and other publications which may be considered standard are, for the most part, already on file. It is hoped to build up in Montreal a large collection of existing literature on these subjects and to keep it up to date. The information contained in the chief libraries of our cities and towns is surprisingly small. It is felt that a special forest products library would be of immense value to the pulp and paper industry, as well as to the lumber, wood preserving, wood distillation and allied industries. The library of the Laboratories will be housed in the new headquarters at 700 University Street, Montreal, and will be open to the public for reference. The Laboratories will also undertake to furnish information on processes used in treating wood and on products manufactured from wood as raw material.

To carry out these plans the Laboratories ask the support of those who have at heart the welfare of our great Canadian forests and the industries dependent on these forests. Special difficulty has been found in obtaining back numbers of important periodicals and journals. The Superintendent of the Laboratories has called on the "Pulp and Paper Magazine" for back numbers (prior to January 1st, 1914) of our periodical, and two important German journals, "Papierfabrikant" and "Wochenblatt für Papierfabrikation." We have gladly turned over what we had of these and other journals with the knowledge that they will be care-

fully reviewed and indexed and preserved for the benefit of the Laboratories and the paper industry at large. However, the files of these journals are far from being complete and the Laboratories, through the columns of this magazine, wish to learn the names of those who have back numbers of the above journals on file and with whom the Laboratories might communicate in reference to procuring these files either temporarily or permanently. This is a matter which warrants the careful attention of parties possessing these journals for the reason that the information contained therein will be systematically arranged and made available to the industry at large. Communications should be addressed to Superintendent, Forest Products Laboratories of Canada, McGill University.

DYESTUFFS.

One outstanding economic relation which has been brought out by the present war is the practical dependence of the rest of the world upon Germany for its supplies of dyes, particularly the aniline colors. England is now wholly cut off from the usual source of supply, and only a fraction of usual consignments has reached America.

The situation is most difficult. Neither England or the United States is willing to undertake the manufacture of these dyes if the war is going to last only a short time, particularly as the possibility of success in such an enterprise is dependent upon factors which have long been peculiar to Germany alone. The patient persevering temperament of the German chemist has found its reward in just such painstaking work, and in facing the problem the Anglo-Saxon chemists realize that they lack the minute details of a highly specialized industry.

In England committees are actively at work endeavoring to find the way out of the difficulty. They have arrived, as a recent London paper says, after a great deal of discussion, at two policies, between which a choice must be made: the first, the policy of devising some sort of emergency organization to tide the trade over until the end of the war and the German chemical industry is supplying England again; the second, the policy of making a bold attack on the German industry, on such a scale as to attempt to displace it permanently. The difficulties of the larger scheme are acknowledged by its partisans. It would need a capital of millions, rather vague, but certainly considerable number of millions; and, as we should not have the accumulated works' experience of the Germans, it would be at least three years before British production was anything like so efficient and economical as the large scale production of the German firms. If the war were to come to and end before this stage had been reached the industry would be exposed to the competition of the German firms, and the capital might be lost. The fear of this is responsible for the suggestion now being made in some quarters that a State

subsidy, or an import duty system, should be established to guarantee the existence of the industry until it had found its feet."

A member of one of the two most prominent chemical firms in England, to whom the country looks for leadership in setting up the dye industry, says that it is hopeless to endeavor to replace the German goods. German patents cover the whole field, and would require an immense amount of study. German capital has run into the hundreds of millions, and the German research system, which forms the basis for it all is not in any wise duplicated in England.

In the United States the position is practically the same, although United States chemists are laying very broad claims for the permanent establishment of the industry.

In reference to increasing the domestic production of dyestuffs, the New York section of the American Chemical Society held a meeting recently and voted a committee to examine into the feasibility of such a step and report to the section on November 6. The committee is looking for suggestions of a very definite and practical nature.

It looks now as though in both countries a great many dyes would have to be passed over for the present. The situation in Canada, which, as a country manufacturing practically no dyes, and removed from the import of German colors, even through the United States, is likely to be very acute. This is one of the sacrifices of the war, and one of the tributes to the ideal of peace.

THE COURSE OF THE WAR.

The man who asks "when will the war end," is in one sense one of the most discouraging individuals extant. He is quite often the pessimist or the little mind who is hopelessly bewildered by the awfulness of the social and economic upheaval, above all he is often the indolent, complaining man who does not realize that war should mean every man to the front—be it of battle or of business.

But there are those who are looking at this question with the most earnest desire to understand some of the outstanding conditions of the conflict to place business in its strongest position during the disturbances.

Such a man is Mr. W. D. Lighthall, of Montreal, who writes to the public press the results of patient questioning and analysis in respect to this matter. Mr. Lighthall is one of the foremost of Canadian legal minds, and an author and lecturer of repute. His studies lead him to the conclusion that the real question is not which side will win, but of how soon the exhaustion or practical exhaustion of Germany and Austria will arrive. Mr. Lighthall finds some authorities view the question from the point of view of finance, others that of provisions and ammunition, others the loss of men, and still others the possibility of a revolution or internal disaster to our enemies.

1.—From the finance point of view, LeRoy Beaulieu, the most distinguished expert in the world, considers the end of the war should arrive about seven months from August 1st, in other words, about the beginning of March.

2.—This agrees substantially with the opinion of the London "Economist" in August last, that the resources of Germany would probably become practically exhausted in about six months.

3.—The losses of Germany in men, including her casualty list, and the losses from other causes than those included in the casualty list, are admitted in Berlin to be over 700,000, and are calculated by a number of the world's military experts to approach 1,000,000. As these are her first line troops of which she has about 4,000,000 available for fighting, and as this is her real effective army, that army would be reduced to half in about six months from the beginning. It is true that there may be less losses from fighting in the winter; but the losses from disease and privation, will probably more than make up the difference. With only 2,000,000 available first line troops, she could not hope to carry on the war against the overwhelming numbers on both sides.

4.—As for the corresponding losses of the allies, they are practically negligible, because Germany is bleeding at both ends, while each of them is at the present time both England, France and Russia, far more powerful in their resources, and their combination is therefore overwhelming. Austria is left out of the question, because it is useless on the western line and paralyzed on the eastern.

5.—It will be noticed that all these estimates based on the opinions of the leading statisticians of the world, point to the close of the war before next spring, if not during the winter. Other important causes may enter to shorten the date, such as the overthrow of the Militaristic party from within (in which event peace will be comparatively easy), or particular exhaustion in some necessity, like horses, the life of which is very short, and of which it does not appear that Germany has or can obtain a sufficient supply. The possibility of revolution or discontent, or the break up of the Austrian Alliance may also form features, but these would only accelerate the date. On the other hand it may be somewhat delayed by some very remarkable German victory, or by some extreme stiffness on the part of the allies concerning terms of possible peace.

6.—The opinions of purely military men have fixed much longer dates, but these are scarcely of the same value of those of statistical experts.

Mr. O. W. Porritt, of the new amalgamation of Joseph Porritt and Sons, Ltd., J. H. Spencer and Sons, Samuel Porritt and Sons, and Porritt Bros. and Austin, who has been visiting Canada, is accounted an exceptionally generous donor to the Patriotic Fund in England with a subscription of £1,000.

MOISTURE QUESTION UP.

(Special to Pulp and Paper Magazine.)

New York, October 25.

The Associated Dealers in Paper Mill Supplies of New York met on October 14, and discussed a plan that is in the hands of a special committee, for determining a more equitable basis of purchase and sale of bagging in which there is moisture. It is the hope of the Association that a fair average percentage of moisture can be determined and a rule adopted that will do justice to the dealers and mills.

A number of experiments have been performed showing the average moisture, but these have not been formally adopted by the committee.

TRANSPORTATION IMPROVED

Van Buren, Me., October 24th.—The completion of the new railroad bridge connecting the Bangor and Aroon stock R. R. at Van Buren, Me., with the Canadian Pacific, Grand Trunk Pacific and International railways at St. Leonards, N.B., by spanning the St. John River at this point, provides another convenient source of supply of Canadian pulp wood for the Maine mills.

Along the line of the International Railway, which connects Campbellton on the Bay Chaleur with St. Leonards on the St. John River, there is a rich lumber section, which already supplies some of the saw mills at Van Buren with logs. With an all rail connection it is expected that a considerable supply of pulp wood will find its way into Maine from this section each season.

Work has just been commenced on the bridge, and under the terms of the contract it is to be completed by March 1, 1915. Its cost will be in the vicinity of \$250,000, and it is owned by the Van Buren Bridge Company.

Not only will it provide an outlet into the United States for the lumber interests, but also the fishing interests on the Bay Chaleur, bringing the Boston market in close touch. The deep water terminal of the Bangor and Aroostook Railroad at Stockton, Me., will provide a winter shipping point for the connecting railroads in the Dominion if the occasion arises for its use.

OBITUARY.

Frank W. Robertson, Hinsdale, Vt.

Frank William Robertson, one of Hinsdale's most prominent citizens, died Saturday night, October 11, after a long illness with kidney trouble. He has been in declining health the past few years, and almost exactly a year and a half ago he had a severe illness, from which he rallied but partly, and ever since requiring the services of a nurse.

For generations back the Robertsons were paper manufacturers, and he naturally took up that pursuit, joining his father in the business in 1870, under the firm name of Robertson and Son. Ten years later he sold out his interest to his brother, George A., and forming a partnership with another brother, Edwin C. bought a paper mill in Holyoke, Mass., and operated the same for two years. In 1882 the brothers returned to Hinsdale and built a mill at Lower Ashuelot, which has since been operated with success under the firm name of Robertson Bros. The product of the plant is high grade tissue paper.

NORWEGIAN WOOD PULP, CELLULOSE AND PAPER INDUSTRY

ISSUED BY THE NORWEGIAN WOOD PULP ASSOCIATION, THE NORWEGIAN CELLULOSE ASSOCIATION, AND THE NORWEGIAN ASSOCIATION OF PAPER MANUFACTURERS. EDITED BY THE SECRETARY OF THE ASSOCIATION OF NORWEGIAN MANUFACTURERS: N. W. ROGSTAD.

INTRODUCTORY

We can hardly imagine now the difficulties in finding suitable writing materials which men had to overcome when they started to communicate with each other in writing. Before the use of paper several things were used. In olden times men used pieces of wood, bark of birch and mulberry, tiles, stone, palm leaves, bamboo sticks, metal slabs, etc. Later on writing material made of vegetable substance was used. The Egyptians very early learned how to make a kind of paper sheet which they obtained from the bark of the papyrus plant. This art they transferred later on to the Greeks. The Chinese long before the Christian era made paper from plant fibres and rags, but their invention did not reach Europe even in the Middle Ages, and when the papyrus plant could not be obtained more, hides were prepared for the use of writing material and this was called parchment after the place from which the best product was obtained.

At last the Arabs and the Moros brought the art of papermaking from China and the first paper mills were erected about the year 1300 in Germany and Italy and a little later in France. In England and Holland the paper industry was introduced at the end of the 15th century and was developed, especially in Holland, through improved methods of reducing of materials used. The machine is called the "Hollander."

After the art of printing was invented the demand for paper increased and this caused numbers of improvements to the methods of papermaking, among these the invention of the real paper machine at the beginning of the 18th century. The call for a better quality of raw material occasioned another substitute for rags, which had hitherto been the only material used.

At first straw was used but later on about 1860, 70, spruce and poplar were used, the fibres of which proved to be very well adapted for the manufacture of paper.

Mechanical Wood Pulp.

Friedrich Keller from Sachsen, Germany, invented in 1843 the manufacture of paper from wood. At the time nobody believed that his invention would be of any importance, nor did anybody think that this invention would cause Norwegian timber to be mainly exported as wood pulp instead of as lumber, planks and boards. The wood grinding machine which Keller had invented was improved by the engineer Heinrich Voelter of Hertenberg, Germany. This improved machine was called "Voelter'sche Defibrirer." Through this machine it was possible with a supply of water to grind wood blocks to fibres which were sorted in a screen, after which the coarse fibres were ground in machines called "refiners." The product then was shaped to board in wet machines, in which the water was pressed out as much as possible. Then

it was shaped in rollers into different sizes and still more water was pressed out through hydraulic presses. The product then was packed in bales. These operations have been retained up to this very time.

About 1870 a great number of paper mills modelled upon the Voelter system were erected in Germany. The paper industry was thus far advanced before people of this country (Norway) understood that this industry was especially adapted for Norway.

About 1866 the first experiment of wood grinding was made in this country. Mr. Karl Meinich started a small plant on Bjeelsen, near Kristiania made by his own people, and ground wood pulp for the Bentsbrug Paper Mill. This example was followed in 1868 by Dr. Tobiesen who ordered two grinding machines (Voelter model) to be constructed at the Kristiania Mekanikal Verksted, and installed a small grinding plant at Bagaas Bruk, on the Akerselevn River.

In 1869 Granfos Bruk at Lysaker, Ankers Sliperi at Fredrikshald, and Praestesæter Sliperi at Brumunddal, were erected. Then followed in 1870: Kongssagene Brugs Sliperi at Modum and Hansen and Kittelsens Sliperi at Skien; in 1871: Labro Sliperi at Skollenborg; in 1872: Embretsfos Bruks Sliperi at AAmot and Lands Sliperi at S. Land; in 1873: Broedrene Foss's Sliperi at Vestfossen, Rygene Sliperi at Arendal, Hofsfos Sliperi and Follum Sliperi at Hoenefos; in 1874: Funnefos Sliperi at Saeterstoen, Hunsfos Sliperi and Hegermans Sliperier per Kristianssand and Laugstol Sliperi at Skien.

However, all these plants in Germany, Norway, Sweden and other countries, caused the price of wood pulp to drop so much that the plants were unable to yield a reasonable profit, although at that time the production of wood pulp was rather small (In Norway about 30,000 "wet-tons" per year).

Nobody thought at that time that the production of wood pulp would reach above 800,000 "wet-tons" per year 35 years later.

Towards the end of the eighties the demand for wood pulp increased and the prices went up. The cost of producing paper also decreased somewhat on account of improvements as to the machines, and the ideas that Norway was a country especially adapted for producing wood pulp with its vast forests and waterfalls were again held forth, and many new plants were erected. In 1880: Randsfjord Sliperi per Randsfjord, Hoenefos Sliperi at Hoenefos, Mago Sliperi at Eidsvold, Kongsberg Sliperi at Kongsberg and Solskinna Brugs Sliperi at Skien. In 1881: Heen Sliperi at Heen, Bartheldsens Sliperi at Eidsvold and Skjaerdalens Sliperi at Skjaerdalen; in 1883: Adalens Sliperi at Heen, Baegna Sliperi at Hoenefos; in 1884: Hofs Brug at Hoenefos; in 1885: OErje Brugs Sliperi at OErje. In 1886: Grubbe Brug at Skien; in 1888: Glommen Sliperi at Askim, Eggeland Sliperi at Risoer and Kalsvold Sliperi at Lillesand; in 1889: Kummerfos Sliperi at Krageroe, Fossing Sliperi at Krageroe, Schioetts Sliperi at Skien, Lunner Sliperi at Grua, and

Saugbrugsforeningens Sliperi at Fredrikshald; in 1890: Kistefos Sliperi at Randsfjord, Vafos Sliperi at Krageroe and Ramsfos Sliperi at Kroederen and Cappelen's Sliperi at Hollen.

The rapid development of the wood pulp industry again caused falling prices and at the same time the prices of lumber and timber went up on account of the increasing demand, and the business soon did not yield a good profit at all.

The mechanical wood pulp is mainly produced in this country as wet, white spruce pulp in laps of 50 per cent substance and is called "First class wet spruce pulp." This is either produced through "cold grinding" or with small supply of water through "hot grinding." There is also manufactured "dried" spruce pulp in board shape; in one of the mills the pulp is shaped in thin, dried leaves, packed in bales and hydraulically pressed. Also from poplar some pulp is produced. Some mills also produce brown pulp from wood of long fibres which is steamed or boiled.

The production of white and brown spruce pulp in Norway, for sale, wet, in tons 1016 Kgs. 1890 to 1913:

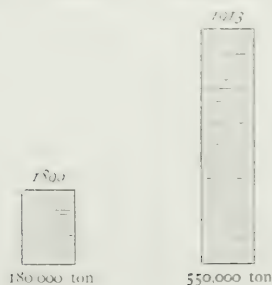
THE PRODUCTION OF WHITE AND BROWN SPRUCE-PULP IN NORWAY. FOR SALE, WET, IN TONS 1016 Kgs 1890 to 1913.

Year	Production in tons	Year	Production in tons	Year	Production in tons
1890	180,000	1898	289,000	1906	395,500
1891	193,000	1899	313,800	1907	423,000
1892	175,900	1900	313,000	1908	450,000
1893	221,000	1901	312,800	1909	487,000
1893	237,500	1902	357,000	1910	479,000
1895	215,300	1903	347,000	1911	426,000
1896	245,900	1904	327,000	1912	528,000
1897	251,600	1905	345,000	1913	550,000

* No work for some time.

These quantities only represent that part of our production intended for sale. In these figures are not included the pulp used in the making of paper and board. This part of the pulp production, according to the official production statistics of 1909 was 29 per cent of the whole production of pulp. If this relation was the same in 1913 the total production of woodpulp in 1913 should be about 775,000 tons wet. In consideration of the enormous progress of paper production in our country since 1909, an increase of 40 per cent, the real production probably would be about 800,000 tons in 1913 (total production) of which 250,000 tons is used as raw material in the paper industry.

Norway's Production of Woodpulp For Sale.



From the table we learn that our production of wood pulp in 1913 was more than three times as large as in 1890.

In 1909, 59 per cent of the pulp was produced in Eastern Norway. In "Buskerud County" alone 40 per cent of the total yield of the country was produced. In Southern Norway (Bratsberg and Nedenes County) 30 per cent is produced. The rest of the production is divided among the Northern parts of the country.

Cellulose.

(Chemical Pulp.)

As raw material for the manufacture of paper "mechanical wood pulp" has not all desirable qualities. With the exception of the "semi-chemical" or brown wood pulp, which is made by the grinding of steamed wood, paper cannot be made of unmixt mechanical pulp. In the manufacture of paper made of wood pulp, other raw materials can be used, as materials with long, elastic fibres, for instance, wood cellulose. In the manufacturing process these fibres make a mat and the mechanical pulp is filled between the fibres as filling material.

After numerous experiments to find suitable raw materials from trees and fibrous plants for the manufacture of paper, the production of cellulose from the tree by the chemical process was begun. Considered as an industry, the beginning of this production by the chemical process was made at the middle of the sixties, when the first plants were erected in England and United States of America.

The chemical wood pulp or cellulose is cooked at a high temperature (120 to 180 degrees Centigrade) in large, closed boilers. After the bark has been removed the wood, which is cut in small pieces, is poured into these boilers together with the liquid that shall dissolve the "sap." If the liquid is a "lye" which contains caustic soda or sodium sulphide the product is called "soda cellulose" or sulphate cellulose. If the acid contains a sulphite, as a general rule calcium bisulphite with an excess of sulphurous acid, the product is called sulphite cellulose.

After the dissolution of the wood-incrusts, these are washed away, the wood-cellulose remains as short or long fibres. This gives a splendid raw material for almost any kind of paper. In unbleached condition soda is used, and the sulphate cellulose mostly for better classes of wrapping paper, envelopes, etc., while unbleached sulphite cellulose is used for newspapers and all kinds of cheap printing paper. In the bleached condition both soda and sulphite cellulose are used for better class of book and writing paper.

The soda cellulose industry originated, as before mentioned, in England and the United States of America. Sweden, however, started the first sulphite cellulose mill. The plant at Bergvik near Soederhamn, was started at the end of the seventies by the inventor Karl Daniel Ekman 1845 to 1904. He kept the details of the cooking a secret to himself, and the real creator of the sulphite industry, therefore, is the German chemist, Professor Mitscherlich, who took his patents out about the same time as Ekman. Contrary to the proceeding of Ekman, he at once started plants at the beginning of the eighties all over the world.

The first Norwegian plant for the manufacture of chemical wood pulp cellulose was started in 1874 at Haistund by the engineer F. Stoerner 1839-1900. It was based on the soda method. Later, on the initiative of this great inventor, and according to his

plans, mills at Moss, Ranheim and Bamble were erected at the beginning and middle of the eighties. The sulphate cellulose industry has its greatest economic importance through the appliance of all kinds of waste from the saw mills, timber of poor quality and also Scotch pine. This cannot be done by the sulphite process. Modelled on the Mitscherlich system, the first mill, Skien Cellulosefabrik, was erected at Skien, at the beginning of the eighties and the sulphite industry has developed more rapidly than the soda (and sulphate) cellulose industry. In 1885 to 1886 there were four mills of each kind in Norway, but in 1914 the numbers of sulphite plants have increased by 23, producing 265,000 tons. The numbers of the sulphate cellulose mills is only 7 and their production is 55,000 tons.

The table below shows the increase of production of sulphite and sulphate cellulose respectively from 1891 to the present year. The figures are supplied by the Association of Cellulose Manufacturers. While the figures for wood pulp only indicate the production destined for sale, the figures below from the Association of Cellulose Manufacturers also include the production destined for their own use.

PRODUCTION OF CELLULOSE IN TONS DRY
CALCULATED TO BE

Year	Sulphite bleached and unbleached	Sulphate	Together
1891	16,992	5,558	22,550
92	24,000	6,800	30,800
93	29,800	10,200	40,000
94	34,600	10,700	45,300
95	41,600	9,900	51,500
96	53,500	8,500	62,000
97	62,800	11,300	74,100
98	64,800	13,000	77,800
99	70,900	10,100	81,000
1900	102,300	12,700	115,000
1	100,200	12,700	112,900
2	95,700	12,100	107,800
3	97,400	11,000	108,400
4	103,300	15,500	118,800
5	123,500	15,300	138,800
6	144,500	16,600	161,100
7	135,800*	23,500	159,300
8	182,200	26,300	208,500
9	175,900	33,600	209,500
10	191,000	36,800	227,800
11	171,700*	38,000	209,700
12	238,500	43,000	281,500
13	254,000	50,200	304,200
14	265,000	55,000	320,000

* No work for some time.

The production of cellulose in the year 1914, viz.: 320,000 tons, is about 14 times larger than in 1891.

Norway's Production of Cellulose.

1891



1914



Also in the cellulose production the "Buskerud County" is the leading county. In 1909 40 per cent of the total production of cellulose of the country was produced in this county. Eastern and Central Norway has 57 per cent of the total production.

Also in the cellulose industry the rapid increase and development of the production has caused a corresponding fall of prices.

Paper.

The transition from hand-made ("vat") to machine paper, took place at the beginning of last century. We have already mentioned the importance of the invention of the paper machine. It was M. Robert, a Frenchman, who invented the paper machine in 1799. This paper machine forms and drains the paper mass and presses and dries the paper sheet in long, continuous pieces. Robert's invention was later on improved by John Gamble and Bryan Donkin, both Englishmen. The principle of Robert's paper machine has been retained, but, of course, with many improvements as to details. The typical feature is the endless wire, on which the pulp is poured and gets the shape of a continuous paper sheet. The fibres are partly placed lengthwise, and partly across each other and at the same time the first draining is made.

In 1838 the first paper machine was introduced in Norway. This was acquired by Bentse Papirmølle on Åkerselven. This paper machine was later on sold to Boehnsdalens Papirfabrik, where it was working until the mill was destroyed by fire in 1908.

It was not until wood was used as raw material that the paper industry grew to be an important industry in the modern sense. The Hollander reduces the ground wood and the cellulose to a pulp mass and during this process fillers, sizes, and dyes are added. These materials are added to give the paper the proper form, weight, color and finish. Having passed through these processes, the mass goes to the paper machine, where the paper is formed on the wire. Thereupon the mass passes through several presses and over drying cylinders and then, according to the requirements, it goes to cutter, calender or roll.

In Norway the paper industry has developed very rapidly. While in 1870 only six paper mills were operating in the country, the number had increased to 16 in 1900, in 1909 to 35, and in 1913 to 38. To these must be added six board and box mills. Reports of the total production of paper in Norway from 1893 is available. These reports, gathered by the Association of Paper Manufacturers, are given below. In these figures, the production of a small mill, which does not belong to the Association is not included. The output of this mill is calculated to be about 450 tons per year, and the paper is all sold in Norway. The figures for 1913 do not include two mills erected in 1912.

PRODUCTION OF PAPER (NOT BOARD) IN TONS:

Year	Total domestic sale in tons	Export tons	Total output Tons.
1893		19,302	
1900		47,362	
1901		48,088	
1902		49,500	
1903	10,281	53,600	63,881
1904	11,057	61,264	72,321
1905	11,794	82,100	93,894
1906	12,652	98,825	106,477
1907	13,250	94,605	107,855
1908	15,187	109,304	124,491
1909	15,300	124,070	139,370
1910	16,752	140,449	157,201
1911	18,865	131,265*	150,128
1912	21,108	154,448	175,556
1913	23,783	177,305	201,088

*No work for some time.

From the mills herein mentioned, the total output in 1913 was about 210,000 tons. From the table it appears also that the production during the 11 years from 1903 to 1913 has increased more than three times. In 1913, 80 paper machines were in operation, compared with 67 machines in 1909.

We note with pleasure the ever-increasing sale in the domestic market. 24,233 tons of the domestic paper production were disposed of at home. To this quantity must be added the import of foreign paper, which amounted to 3,454 tons in 1913. The total domestic consumption amounted thus to 27,687 tons, which corresponds to 11.4 kgs. per inhabitant. The corresponding consumption in Denmark and Sweden is 16.2 kgs. and 20.9 kgs. respectively, according to reports for the year 1913. The consumption of paper in our country, it appears, is far below that of our neighboring countries. We can, however, comfort ourselves that in Portugal, Greece, Rumania and Servia, the consumption, according to Krawany's paper statistics, is only between one and two kilos per inhabitant.

In "Buskerud County" 35 per cent of paper was produced. In "Bratsberg County" the figure is 25 per cent. Eighty-seven per cent of the total paper production is in Eastern and Southern Norway.

Norway's Production of Paper.



Prices of Wood Pulp.

The prices of wood pulp, which from about 1869 to about 1874 declined from about kr. 130 84/100 to about kr. 90 (\$24) per wet ton, f.o.b. Norwegian port, continued falling until 1899, as shown by the table below. At the same time, timber prices advanced steadily. Raw materials have had a tendency to go up in price up to this present year. Wood pulp has, however, as shown by the table, remained firm with the exception of an advance in price for a short time during the years 1900 to 1902, 1905, 1908, and 1909. The difficulties which this industry has had to overcome are mainly attributed to the disproportionate rise in the price of timber in Norway, as compared with that in other countries with which we have to compete on the market. Owing to higher wages paid nowadays, and other difficulties in connection with the labor question in the mills, higher cost of production, in spite of improvements made in machinery, has come about. All these things are obstacles for the pulp and paper industry of our country. The paper mills, which have their own forests sufficient to meet their demands for raw materials in whole or in part, and are favorably located with cheap water power, are far better off. If money is invested in new plants, forests are also invariably purchased at the same time in connection with the new mill.

Wood Pulp Prices.

Where two prices are given, they indicate the highest and the lowest quotations. Until 1905, prices were quoted for "baled pulp," and later on for "pulp

WOODPULP PRICES

Year	Wet mechanical pulp per English ton (1016 kgs.) \$	Year	Wet mechanical pulp per English ton (1016 kgs.) \$
1877	26	1901	11-10
1880	21	1902	11-8
1885	13	1903	8
1891	10	1904	8-14
1892	10	1905	14-10
1893	11-12	1906	9
1894	12-15	1907	10-15
1895	10-8	1908	15-11
1896	9	1909	12-10
1897	10	1910	10-8
1898	10	1911	9 12
1899	8	1912	9-10
1900	14-16	1913	10-8

packed with staves." The packing is calculated to cost kr. 2.50 (70c.) per ton.

CELLULOSE PRICES.

The following table shows the different prices for sulphite and sulphate cellulose.

Year	Sulphite (strong) per ton	Sulphate (strong) per ton
1891	57	
1892	51	46
1893	54	48
1894	46	40
1895	38	32
1896	38	33
1897	40	36
1898	39	36
1899	42	35
1900	39	36
1901	38	35
1902	32	32
1903	31	29
1904	33	29
1905	35	36
1906	36	38
1907	35	38
1908	34	37
1909	33	35
1910	32	33
1911	32	33
1912	32	33
1913	35	32

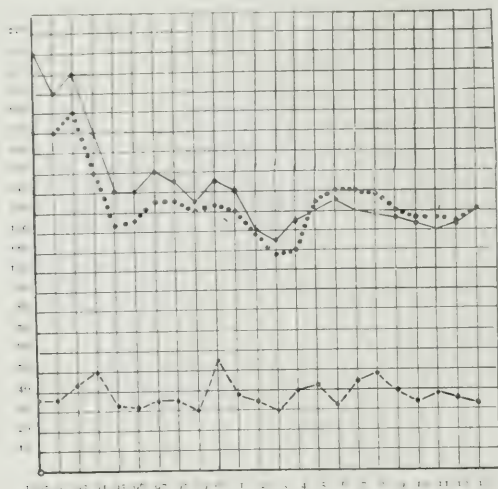
The prices for sulphite from 1891 to 1904 are taken from the annual reports of "Drammens Trælasthandlerdirektions" (Board of Directors of Drammen Timber Merchants), compared with quotations from the records of "Norsk Cellulose Forening" (Association of Norwegian Cellulose Manufacturers). The reports from 1905 to 1913 are gathered from the office of the "Scandinavian Association of Cellulose Manufacturers" at Stockholm (Sweden).

Cellulose and Wood Pulp Prices, 1891-1913.

The prices sulphate cellulose before 1899 are based on extracts from the records of the "Norsk Celluloseforening." From 1905 the reports have been obtained from "Den Skandinaviske Cellulose Forening's" statistical bureau at Stockholm.

The cellulose prices, both sulphite and sulphate, declined heavily from 1891 to 1903. In this year the lowest price was touched, as the table shows. The prices were in 1903 82 per cent and 58 per cent lower than in 1891, sulphite and sulphate cellulose respectively. Since 1903, prices have had an upward tendency, but are still far below the ruling prices, in the nineties. The diagram explains the movements of

wood pulp and cellulose prices during the years between 1891 and 1913 (in kroner per ton).



Cellulose and Wood Pulp Prices—1891-1913.

Continuous line—Sulphite-cellulose.

Dotted line—Sulphate cellulose.

Dash line—Woodpulp.

Paper Prices.

Comparing paper prices during several years, it must be borne in mind that the different kinds of paper have different prices, and represent different values. It is, therefore, necessary to select some special kinds of paper as standards of value.

The export paper from Norway has mainly during the last few years been reel paper, which is the cheapest kind of printing paper. Therefore, this kind of paper is the best applicable to the determination of movements of prices. The relation between printing paper (by printing paper is meant mainly newspaper, both in rolls and in sheets, also better classes of printing paper, glazed printing paper and glazed, colored printing paper) and wrapping paper (by wrapping paper is also meant sulphite paper, cellulose paper, kraft paper, grease-proof paper and tissue paper) was in 1911 seven parts printing paper to five parts wrapping paper. It might safely be said that reel paper comprises about 50 per cent of Norway's paper exports. Therefore, this kind of paper is well suited to be the standard of value.

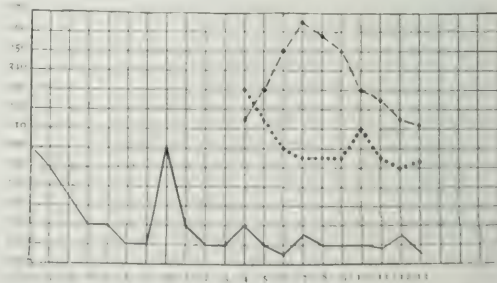
In 1893 the prices for reel paper was kr. 200 (\$54); in 1894 the price declined to kr. 190 (\$51); in 1895 the price fell down to kr. 175 (\$47), and in 1896 to 1897 to kr. 160 (\$43). In 1898 and 1899 the price fell as low as kr. 150 (\$40).

At this moment, however, something happened, which altered the prices considerably. The Boer war broke out, and the consequence was an increased consumption of paper, especially in England, but also partly in other English speaking countries, so that the demand could not be met. At the same time the prices of wood pulp were forced up to an unusual height, owing to several circumstances, such as scarcity of water, heavy exports to the United States, etc., so that prices up to kr. 60 (\$16) were obtained for wet wood pulp.

In 1900, without any difficulty, prices as far up as kr. 200 (\$54) were paid for reel paper. On the other hand, several agreements for delivery of paper had previously been effected, so that this sudden rise of prices did not benefit all the mills. After the Boer war, prices gave way and in 1901 the price quotation was about kr. 160 (\$43). Then another decline in prices came in 1902 to 1903, and the prices obtained during these years were only about kr. 150 (\$40). Then followed a slight rise of prices in 1904, viz., about kr. 160 (\$43), and then declined in 1905 to about kr. 150 (\$40), in 1906 still lower, about kr. 145 (\$39). No doubt an overproduction of paper on the market had at that time taken place, and the conditions for the paper industry were very serious.

In 1907 the first labor troubles in the paper industry came up, and several of the largest paper mills were idle during three months on account of strikes. This however, settled the trouble of prices and in 1907 the prices went up to kr. 155 (\$42). Later on nothing has influenced the market which has caused any considerable change of prices, and although there have been some movements up and down, the fluctuations have been comparatively small with a tendency towards lower prices. The prices in the years 1908, 1909 and 1910 have been about kr. 150 (\$40), and in 1911 kr. 148 (\$39.50). At the beginning of 1912 prices went up to kr. 155 (\$42), but at the end of 1912 the market was dull, and in 1913 the tendency has been to falling prices, and prices may be calculated to about kr. 146 (\$39). Especially during the last part of 1913 the market has been very dull.

Besides reel paper, special attention should be given to prices of the different classes of paper for export to China and Japan, viz., "Cap" paper and "thin printing paper." This market is of great importance to the Norwegian paper exporters. Finally one must take prices of kraft paper into consideration, which does not include all kinds of wrapping paper made in Norway, but kraft paper is quite an important part. Kraft is undoubtedly the kind of wrapping paper of which the largest quantity is exported in one quality. The diagram below shows the movements of prices of the different classes of paper. Reports as to reel paper are available from 1893. Reports on the others start at the year 1904.



Prices (in kroner) per 1,000, f.o.b. Norwegian Port.

Cost of Production—The Industry and National Economy.

While the prices of wood pulp, cellulose and paper, as mentioned before, for the last years, have had a

tendency towards falling prices, the increasing demand for these goods has made the price of timber rise every year. The table below shows the timber prices from 1891 for the following four river districts: Glommen, Fredrikshald, Drammen and Skien. The movements of prices will be seen from the table to have kept pace with each other in all districts. These figures represent different standards of measurements as, dozens, loads, cubic feet, and cubic metres, etc. To be able to compare them, we have tried to reduce them to one standard of measurement, viz., cubic metres, fixed measurement, delivered in the river. These prices do not include wages for timber-markers, receivers, etc., and all other expenses incurred later. This reduction has been applied both to the table below and to the following diagram. Dimensions, rules annual reports of the timber merchants' corporations, penses of floating and other conditions are different in the four districts. The reports on the Drammen district and the Skien district are obtained from the annual reports of the timber merchants' corporations, and the reports for the two other districts are gathered from the consumers. The figures do not give any idea of the cost per ton in one district compared with the other districts, but show how the prices of raw materials have increased in all districts almost at the same time.

PRICE OF ONE CUBIC METRE CELLULOSE AND GRINDING MATERIAL. 1891 to 1914.

Year	Drammen District	Skien District	Glommen District	Fredrikshald District
	\$	\$	\$	\$
1891	1 82	1 62	1 27	
92	1 88	1 62	1 27	
93	1 87	1 73	1 13	
94	2 05	1 84	1 13	
95	2 00	1 73	1 24	
96	2 08	1 76	1 24	
97	2 24	1 90	1 35	1 37
98	2 30	2 17	1 56	
99	2 30	2 30	1 56	
1900	2 37	2 43	1 68	
1	2 42	2 37	1 68	
2	2 37	2 30	1 51	
3	2 61	2 30	1 54	
4	2 61	2 43	1 55	1 46
5	2 78	2 43	1 55	1 53
6	3 03	2 57	1 69	1 62
7	3 46	2 70	1 80	1 53
8	3 51	2 91	1 85	2 11
9	3 46	3 04	1 76	1 97
10	3 51	3 30	1 90	2 21
11	3 88	3 30	2 43	2 22
12	4 05	3 38	2 70	2 43
13	4 18	3 51	3 00	2 87
14	4 05	3 65	3 13	3 00

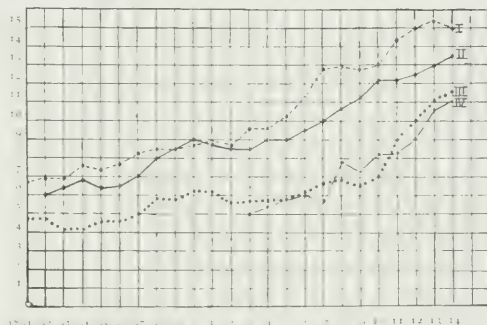
It appears that the rise of price during the last 24 years has been more than kr. 7.00 per cubic metre (\$1.90). This is very important for the country in a social economic sense.

Comparative curves showing the movements of timber for cellulose and grinding material.

The measures are all reduced to one standard of measurement, viz., 1 cubic metre, fixed measure.

Norway's annual output of wet mechanical pulp is about 800,000 tons, and of dry cellulose about 300,000. Calculating a consumption of timber of 1.5 cubic metre, and 5.5 cubic metres per ton respectively, total 2,850,000 cubic metres, the forests yield about kr. 20,000,000 (\$5.4 millions) more than previous to 1891 considering the increase of kr. 7.00 per ton since

that year. Capitalized at 5 per cent, this means an increased value of the forests of the country of about kr. 400 millions (\$108 millions) during the last 24



Comparative curves showing the movements of timber for cellulose and grinding material. The measures are all reduced to one standard of measurement, viz.: one cubic metre, fixed measure. Curve I. Drammen District. Curve II. Skien District. Curve III. Glommen District. Curve IV. Fredrikshald District.

years. It is also very important that timber of poor quality, waste of sawmills, etc., can be used by the sulphate method.

From time to time it appears that some people think that the heavy demand for raw material for the wood pulp and cellulose factories must lead to diminishing the forests of the country. This, however, is due to a misunderstanding.

The wood pulp industry has caused the owners of forests to cut timber of small dimensions. Through this proceeding the ground in the forests is cleared, and the trees get the necessary light and ventilation needful for their growth and propagation. Previously the importance of this care of the forests was not understood properly.

The wages have also increased rapidly during the past few years, and this increase of wages has been comparatively greater in this industry than in any other industry in the country. According to the official statistics, the average wages for adult workmen in the years from 1900 to 1911 were as follows:

Year	The whole industry		Wood pulp, cellulose and paper industry	
	Men	Women	Men	Women
	\$	\$	\$	\$
1900	0 82	0 40	1 31	0 41
1911	1 00	0 50	1 03	0 58

It appears that the wages in 1911, which was the last year for which official statistics could be obtained, were higher in the wood pulp, paper and cellulose industry than the average wages of all other industries of the country. To this must be added that the new tariff, which came into force at the beginning of 1912, means a considerable increase of wages.

The paper "Arbeidsmanden," the paper of the Norwegian Workmen's Association, No. 3, 1914, admits that the wages paid by these industries in Norway are practically the very best wages paid in Europe in this line.

About 14,000 workmen are employed by these industries in Norway. The table below shows the proportion of the total amount of wages paid by the in-

dustry in Norway, appertaining to the cellulose, paper and wood pulp industry. This table is based on official statistics

Year	Wages paid		Wages in % paid by cell. paper & wood pulp mills, of the total amt of wages paid
	Total industry	Wood pulp	
	Mines included	Paper & Cell. mills	
	thousand \$	thousand \$	
1900	14,863	1,555	12.3
1905	15,980	2,126	13.3
1910	27,180	3,591	14.7

A very good idea of the importance of these industries for the country is obtained by considering the figures which these industries represent of the total export from this country. The table below shows that about 50 per cent of the export value must be attributed to cellulose, paper and wood pulp.

Year	Value		% of cellulose paper and wood pulp of the total export of manufactured goods
	Total Export of manufacturer goods	attributable to paper, wood-pulp and cellulose	
	million \$	million \$	
1871-75	1.5	0.11	7.3
1876-80	3.3	0.73	22.5
1881-85	5.4	1.76	32.7
1886-90	7.3	2.69	36.8
1891-95	10.0	4.51	45.6
1896-1900	12.1	7.3	58.3
1901-1905	15.6	9.35	59.7
1906-1910	25.1	14.73	58.2
1911	32.7	16.57	50.0
1912	40.5	20.00	49.2

This table shows how these industries from a very modest start at the beginning of the seventies have developed to be the most important agencies of export from our country.

As to the years 1911 and 1912 (partly) consideration must be given to the fact that a "lock-out" of seven weeks caused such detriment to the export, and hampered the production considerably. The commercial statistics will, therefore, no doubt, give a far better idea of the importance of these industries for the last couple of years.

The following three tables indicate the value of the quantity of the exported wood pulp, cellulose and paper from 1871 to 1912.

Quantity and Value—Wood Pulp.

Year	Woodpulp		Total Value
	Dry	Wet	
	1,000 kg.	1,000 kg.	\$
1871-75		4,605	106,767
1876-80		18,611	362,286
1881-85	9,536	58,400	1,271,351
1886-90	13,194	122,856	1,604,440
1891-95	19,037	165,793	1,940,111
1896-1900	14,115	210,776	2,405,311
1901-1905	14,997	218,199	3,072,903
1906-1910	14,728	475,913	4,481,033
1911	16,498	494,477	5,902,000
1912	14,901	481,215	4,857,513

Cellulose.

Year	Cellulose		Total Value
	Dry	Wet	
	1,000 kg.	1,000 kg.	\$
1886-90	7,973	8,348	732,236
1891-95	28,453	9,306	1,549,227
1896-1900	64,885	6,975	2,609,351
1901-1905	90,011	11,702	3,553,319
1906-1910	132,577	4,876	5,186,140
1911	178,781	1,425	7,006,189
1912	193,910	1,066	8,404,027

Board and Paper.

Year	Board and paper		Total Value
	Dry	Wet	
	1,000 kg.	1,000 kg.	\$
1866-70	30		12,623
1871-75	323		58,984
1876-80	2,561		261,184
1881-85	3,937		273,946
1886-90	5,848		338,303
1891-95	21,376		1,028,397
1896-1900	42,872		2,169,730
1901-1905	58,975		2,736,135
1906-1910	116,108		5,070,265
1911	131,299		5,636,351
1912	155,867		6,789,081

Value of the Annual Export of:

Woodpulp.
\$9.11 million.



1871-75

Cellulose.
\$0.22 million.

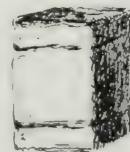


1881-85

Paper.
\$9.95 million.



1871-75



1912.
\$7.86 million.



1912.
\$8.40 million.



1912.
\$6.78 million.

Recapitulation.

We have through this article given a synopsis of the history of the wood pulp, cellulose and paper industry, their social economical importance and the conditions prevailing. These industries are calculated to represent at least kr. 100 millions of investments, \$26 mill., costs of water power plants not included, and employ about 14,000 workmen. The production of these industries represent about 50 per cent of the total export value of the whole country. Moreover, they have caused a very good profit to the timber trade. On the other hand, new difficulties have to be overcome both at home with the labor question and abroad, through a keen competition from the other wood pulp and paper producing countries.

Regarding the present conditions, impartially, the ever increasing prices of raw materials, especially timber prices, and costs of production, and the decreasing prices of the production from these indus-

tries, which has had this tendency to decline for years, there should be every reason for looking after some means to support these industries which are of such vital importance to our country.

Things have come almost to a climax, so that in case that no betterment can be expected for these industries within some years, these industries, for which

our country has better natural resources than most other countries, soon will disappear. The understanding of this fact is of the utmost importance, and should be thoroughly taken in consideration. The Norwegian people, and above all, the Government of public affairs, must all comprehend what enormous values are at stake for our country.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

MR. CHARLES F. MANSELL

General Manager of the Toronto Paper Manufacturing Company

For the last twenty-six years at precisely the same hour every morning with the regularity of a clock, the steadiness of a land mark and the conservatism of a rural community, a short, rather thickly set gentleman with a cheery "good morning" has stepped into the elevator of the historic Mail Building in Toronto. You can tell by his alert walk and rather off-hand manner that he embodies earnestness, thoroughness and system—if you do not believe it, take a look at his desk at any hour of the day and there is nothing misplaced. He is British to the core and carries all the outward evidences and characteristics of the trained and disciplined man of affairs—the staunch, sturdy type that have made "John Bull" a leader in the commerce of the world, on the high seas, or on the field of battle.

Such a representative is Charles F. Mansell, who has had forty years constant connection with the stationery and paper business. For over a quarter of a century he has been sales manager of the Toronto Paper Manufacturing Company whose plant is located at Cornwall, Ont. The mill was established by John R. Barber, Richard Brown, Ed. Trout, Charles Riordon, Dr. Briggs, and other veterans in the trade in 1880, and a few years later Mr. Mansell joined the organization as sales manager. At that time the plant had one machine, seventy inches wide, and the output was about four to five tons per day. Now the equipment consists of three machines, with a total capacity of twenty-one tons daily of book, bond, ledger, envelope and litho papers, and has a sulphite plant with three digesters. The mill also turns out tub sized, pole dried and air dried papers, together with two platers for linen finish paper. The range of prices is from four and a quarter cents to sixteen cents per pound.

When Mr. Mansell first entered the service the highest priced paper was nine cents, while the average was about five cents, but the product that was then disposed of at the former figure, purchasers would not consider now, so great has been the improvement in texture, quality and finish by reason of up-to-date manufacturing facilities. Although the output has more than quadrupled, it has all been sold by Mr. Mansell, who, for a long period has been a frequent and well known visitor to the wholesale trade in Montreal, Ottawa, Hamilton, London and Toronto with whom he has established a solid and friendly connection.

In old London town he was born but spent the greater portion of his boyhood days in Doncaster, York-

shire, where he attended the Grammar School. Later he took a course in the Caversham Academy at Reading, Berkshire, and his first position was with the wholesale pulp and paper stationery house of Waterlow and Sons in London, where he served an apprenticeship of several years. Then one day he packed his



baggage and started for Canada, the land of opportunity. Landing in Toronto he secured a situation with William Warwick, manufacturing stationer (now Warwick Bros. and Rutter), who was doing business at the corner of Wellington Street and Leader Lane. Here he gained a wider experience and insight into

the trade and, after four years' service, he joined the staff of James Campbell and Sons, wholesale stationers and booksellers, of Front Street West, as buyer and manager. He remained until that house went out of business, then rejoined the Warwick firm and represented them for some time. Meanwhile, the business of the Toronto Paper Manufacturing Company had continued to grow, and Mr. Barber, the president and manager, was looking around for a capable sales manager. Mr. Mansell linked up with him and was in close contact and daily association until the retirement of the former about two years ago. When the controlling interest of the company was transferred to other hands, Mr. Mansell was retained in the position of sales manager, a tribute to his fidelity and activity in the interests of the firm. Naturally, in the course of his career, he has witnessed many changes and several superintendents have come and gone, but there has never been a change in the selling end. A gentleman of the old school he has continued in season and out to make his round of calls upon the trade. His visits are welcome, his promises are fulfilled and his service attentive and courteous. Many young men, who were junior clerks and office boys when he first started, are to-day managers and buyers but the same satisfactory relations have ever been continued, for it

has become an axiom with the trade that, once a customer of the Toronto Paper Manufacturing Company always a customer. A couple of years ago, while taking a walk through a new paper warehouse in Montreal Mr. Mansell had the misfortune to stumble against a pile of paper and fell heavily to the floor, breaking an arm. He started home the next day but the mishap did not deter him from coming down to business. Herein may be seen one of the elements of his success, for he is, to use a colloquial expression—"always on the job."

Of hobbies, he has none but work except that he has always been a prominent figure in Masonic circles. He is a Past Master of Zeta lodge, a Past Z of Antiquity Chapter, a Past Preceptor of Cyrene Preceptory, Knights Templar, as well as a Past Provincial Prior. He has been treasurer for five years of Ramesses Temple, Mystic Shrine and Grant Treasurer for nine years of the Sovereign Great Priory of Canada, K. T. On the occasion of his retirement from the position of Treasurer of Cryene Preceptory, he was presented with a cabinet of silver in appreciation of his devoted services. Mr. Mansell is a member of the Board of Trade and, in religion, is an Anglican, attending St. Augustine's Church, of which he is an officer.

REINFORCED CONCRETE LOG CHUTE AND DAM

**EXTENSIVE IMPROVEMENT WORKS BY JAMES McLAREN LUMBER COMPANY AT HIGH FALLS
ON THE LIEVRE RIVER, PROVINCE OF QUEBEC**

By FREDERICK DAVY

There has recently been put into successful operation by the James McLaren Lumber Company, Ltd., of Buckingham, Que., a reinforced concrete log chute, the only one of its kind in Canada—and perhaps in the world. The structure is at High Falls, on the Lievre River, in Quebec, and it is now reported to have been in satisfactory operation for several months. From the standpoint of efficiency in delivering logs it has recorded a great advance over the old timber chute which it replaced, and requires much less water for operation. Moreover, the discharge of the logs is more efficient, as they are delivered parallel to the river surface, thus preventing fraying and splitting of the ends through striking the grave of the somewhat shallow shore. The Lievre River is a stream of good volume and drains an area of 4,000 square miles. At the approach to High Falls it flows over a bed of granite and the sudden drop at that point is about 160 feet. At the head of the Falls the stream is naturally divided into two channels by a rocky island. The smaller of the two is the north channel and in nature the main or south current discharged itself over a rocky precipice in a white foaming mass. The safe delivery of logs over such a place was impossible, so, for years they have been carried down in an old rectangular-bottomed timber built chute. In 1910 the lower section of this structure went out after doing duty for many years. In planning a replacement it was thought that the fact that the McLaren limits could be made perpetual justified a permanent structure. The company then decided upon a concrete chute to replace the old one

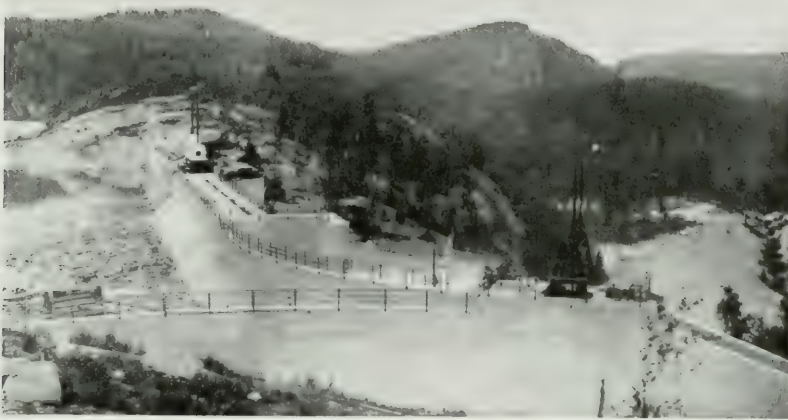
and the discussion of the details concerning it revived a long-cherished desire to improve the advantages of the splendid water power so that it might be utilized so soon as a profitable opportunity presented itself. So, in making the designs for the new chute, it was incorporated as part of a large and excellent scheme of conservation and development.

The scheme included two dams. The more important was across the main or south current. In it were the log chute outlet, the flood gates and provision for five power flumes each capable of furnishing water for a 10,000 h.p. unit. The north dam was designed as a regulating dam and was so constructed as to provide escape for the discharge of exceptionally high water. The log chute was placed to the south of the whole structure.

In 1910-1911 the lower section of the new concrete chute was built and connected with the old section above. As the workable structure thus stood, it comprised 375 feet of concrete and 7,500 feet of timber. Economy in the use of water had to be a guiding principle, as the more water went over the slide the less there would be for power. The V shape was therefore adopted for the chute as it was considered by far the most saving and adaptable. The design of the chute took into consideration the natural narrowing of the current in the gathering speed of the descent and the height of the sides was gradually decreased towards the foot. The maximum slope of the chute was fixed at 1 in 4, except at the lower end. There, about forty feet from the mouth, the gradient was sharply lessened and changed from a straight line to the arc of a circle

of 225 feet radius. The change of grade being near the point of discharge, the retarding of the speed was so small as to be negligible and the result as designed was to throw up the lower end of the log and cause the drop to be made horizontally to the water. The upper end of the concrete chute was finished in July 1912, and used for the discharge of the logs that year, but it was not until the completion of the whole work

blasted for the dam a ledge of the country-rock (grey granite) was left and against this the footing of the dam abuts. The dam has three regulating sluices. The piers between them are approximately in the shape of a long ellipse. The stop-logs for the regulating sluices are of Douglas fir and are twenty-two feet long, thirty-six inches deep, and vary from fourteen to twenty-two inches in thickness. The steam-log winch for hand-



James MacLaren Lumber Company's dam and log chute at High Falls.

that the full efficiency was realized. This year the working of the permanent structure has more than justified the expectations of the engineer and the company. The new structure uses less water, discharges more logs and requires fewer men. The old slide required from fourteen to sixteen men to operate it and it discharged from 12,000 to 15,000 logs in ten hours. The new slide can be worked by six men and will discharge 50,000 logs in every ten hours. The velocity

ling them is operated by a two-cylinder steam engine which was built by the Victoria Foundry Company, of Ottawa.

The five entrances to the power forebay are submerged sluices covered by a reinforced concrete apron to prevent logs from being drawn in. The apron turns the logs to the slide and is carried sufficiently low to be below the point of lowest water. The draught to the power sluices cannot therefore affect the logs



Upper section of concrete log chute.



North dam at High Falls, showing outlets for overflow.

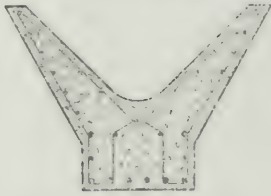
of the logs in the 1 in 4 grade has been calculated to be 55½ feet per second. The total length of the slide over all is 635 feet. Its piers supports number eight. The admission gate for the logs consists of nine stop-logs bolted together. They are ten feet long, twelve inches thick and twenty-four inches deep, and are lifted and lowered by a hand winch.

Everything about the structure is of the most permanent nature. When the foundation trenches were

and the dam is so constructed that they are brought to the slide at all levels of the water.

The plans for the full structure were made in 1911 and the contract was let to Messrs. Haney, Quinlan and Robertson for the construction of the new dam and the completion of the log slide. Pouring concrete was started in the spring of 1912. In the whole work there are 100 tons of steel and 21,400 cubic yards of concrete. The total cost of the structure was \$250,000.

The work here described is but one of several impor-



Typical section of log chute.

tant power development structures that have been

designed by Mr. J. B. McRae, of Ottawa, the engineer for the work. One of them is the dam and power house at Ragged Rapids on the Severn River, which were built for the town of Orillia. Mr. McRae designed the dam and power house now building for the Electric Reduction Company at Buckingham, Que. He also was associated with William Kennedy, Jr., in the design and construction of the splendid dam at the Chaudiere Falls on the Ottawa River, which was undertaken for the large group of power owners of the cities of Ottawa and Hull.—Reproduced by courtesy of "The Canada Lumberman."

BRITISH PAPER INDUSTRY AND PULP TRADE

BUSINESS STILL BRISK AND A RECORD SUPPLY OF PULPS IN SEPTEMBER

FROM OUR LONDON REPRESENTATIVE

The consensus of opinion in London is that the European war may last throughout 1915. That is the prospect before Canadian and British manufacturers, and so long as the upheaval lasts, Germany, along with Austria-Hungary will be minus markets for pulp and paper. German and Austro-Hungarian mills are now practically idle, and the pulp industry will never be revived until Russia consents to the export of pulp wood from her massive and extended forests. Canada, therefore, has a bright outlook and the British market is depending on Canadians and Scandinavians for the supply of raw materials—the regulation of prices partly being in the hands of Canada's producers. That is the position today in a few sentences. The future may bring anything.

Up to the present the British paper mills have had very little to complain of, notwithstanding the wild and unfounded rumours that have been appearing in the American and other journals about a famine. There are only two elements hampering the work of British mills, one is the loss of workers through their moving to join and rejoin the colors, and the second is the shortage in dyes and dyestuffs caused by German supplies being cut off. There is, of course, no artificial dearth of dyes, as the English producers are doing all in their power to meet the present situation, but the prices have jumped from 60 to 100 per cent. This element, therefore, combined with the great cost of production, is telling against producers of colored papers and wrappings, etc., with the result that the output must be restricted. Wallpaper manufacturers are the people who have suffered most and it is stated that no new patterns will be issued in 1915 and that all prices have advanced from 10 to 15 per cent. For fine grades of printing and writing papers the demand is very far and no doubt this demand will be increased considerably as time goes on because of the absence of Germans in the markets of the various neighboring countries. Those markets are being tightly watched and studied by the British Paper Makers' Association and the British Board of Trade, particularly as the tendency is during the present season to turn to British mills for supplies. In many important circles the reports are very favorable about the supply and demand. Makers are still

getting from 3 to 4 cents per lb. while others have advanced from 5 to 7 per cent. Norway is now exporting fully 300 tons of paper per day (her own daily consumption being roughly up to 30 tons per day) a good portion of which reaches England. Then there are Canadian and Newfoundland supplies, so that the British market is fairly well stocked. One drawback producers of newsprint experience is the great falling off in advertisements. In one of my recent despatches I quoted the names of several papers in London which apologized for the smallness of their sheets and pointed out that they were "conserving their paper supply." The real fact is that a great reduction in advertising compelled newspaper proprietors to reduce the size of journals and, of course, some excuse had to be presented to the public. That is what gave rise to the rumours about a "Paper Famine in England." As a matter of fact advertising people have been cutting off their own noses to spite their faces. One would imagine that with a great competitor like Germany out of the markets, advertisers would take advantage of the opportunity and show up their goods in the trade journals as well as the dailies and weeklies. But no; when Germany shut up shop they thought they must do the same. That policy of advertisers has told on newsprint producers; but now the panicky feeling is wearing off. A great many of the British papers are coming back to their old size again, and proprietors are paying more for their paper, in addition to making the discovery that the time had arrived to waken up the advertisers and show them the great opportunities that are before them. The other day I said to a very large and prominent maker of newsprint, "are you still getting the 5 per cent advance on your prices?" "Yes," he replied, "and selling plenty, and tons and tons of pulp are at my disposal for the mill." Mr. Alexander Davidson, in the course of an address to the shareholders of the Mugemoss Paper Mill, in Scotland, said for the year they had just entered upon "that is the present period, they had advanced their prices and were getting them with little or no complaint. Prior to the outbreak of the war they had been fortunate in holding large stocks of raw material, notably wood pulp and in making considerable contracts for the latter

at the old prices a long way ahead, reaching well into next year. He hoped that the cessation of all competition from German, Austrian and other continental mills would enable them to make up for all drawbacks, such as the high cost of production, etc.

The Pulp Trade: Canada's Shipments.

The market for sulphite, sulphate, and ground wood pulps is somewhat unsettled. Importers are selling against each other and prices vary, so that it is very difficult to give accurate values. All British mills are well stocked and there is a good supply to fall back upon. Ground wood producers are begging mill owners to relieve them of their supply, but the response is next to nothing. The present situation has arisen in this way: In July mills producing wood pulp had fair stocks of the raw materials on hand and business not being plentiful, they abstained from buying, being simply contented with deliveries under existing contracts. Then in August the war broke out, and being unable to gauge what the near future might bring, there was a rush for all kinds of pulps to augment in a large degree the stocks at mills. Buying was brisk, and some good prices have had to be paid in some cases. Inquiries were also made about 1915 deliveries, and these are still going on. That is one of the reasons why the imports of pulps have jumped so much in September as the following figures show:—

September.	1913.	1914.
Chemical wood pulp	36,626	83,104
Mechanical wood pulp.	62,631	88,130
January to September.		
Chemical wood pulp	280,260	304,055
Mechanical wood pulp	414,853	423,876

These figures depict the result of the buying in August after the war broke out, and I am told that to-day there is as much ground wood and other pulps lying at Queenborough, Hull, and other ports as will last the mills a considerable time. However, the steady rate at which paper mills are now working should materially reduce supplies. The exports from Canada in September to the British consumers were as follows: Moist ground wood, 32,027 tons, compared with 16,116 tons in September 1913, or 81,296 tons for the nine months ending September compared with 48,857 tons in 1913. Sweden more than doubled her supplies to England in September, and the same may be said of Norway as regard sulphite and ground wood moist. Since these figures have been published, a considerable quantity of pulp has arrived, the returns for the first two weeks in October the latest available being: Ground wood pulp, 25,564 tons; chemical pulp, 127,857 tons. Of these supplies 7,584 tons of ground wood arrived from Newfoundland and 7,313 tons from Canada.

It is difficult to quote prices. Easy bleaching sulphite may be obtained from \$45 to \$48 and \$49, unbleached soda from \$46 to \$48 and strong quality at lesser values. Kraft pulp is about \$38 to \$45. The fact is that importers are selling one against the other, and I have seen so many quotations that it is difficult to say what is the fair one. Ground wood moist is down to \$10 and \$10.50.

One reason why the imports of Canadian pulp have increased is the good quality supplied. One of the largest buyers in London told me the other day that he would sooner handle Canadian mechanical and sulphite than any other produced. "We buy Canadian mechanical," he said, "because it is stronger, and the

newspaper men say that the paper made from it is excellent for the fast running machinery in the offices in London." That is the opinion of a gentleman who is highly respected in wood pulp circles and I give it for the information of Canadians, so that they may utilize their energies in trying to fulfil the requirements of the British market. "Give us Canadian pulp, but for goodness sake don't overcharge for it," is a common expression in London. Indeed, the largest cargo of pulp that has reached England for some time arrived a couple of weeks ago from Canada. It consisted of 4,000 tons of pulp from the Chicoutimi Pulp Company, of Chicoutimi.

Messrs. Lloyd, Ltd., have sustained a loss by 2,500 tons of sulphite going down in a vessel bound to Queenborough from Sweden. In Scandinavia the pulp markets are very dull. Sweden reports that British buyers are making enquiries for 1915 contracts. Esparto is easier in prices, but business owing to the reduced output of esparto papers in Scotland, is dull. There is a good demand for rags and prices are on a higher basis.

EXECUTIVE OF A. P. & P. A. ACTIVE.

Special to Pulp and Paper Magazine.)

New York, October 25.

Much interest has been shown in the trade in the latest developments in the affairs of the American Paper and Pulp Association. The executive council met on October 16, at the offices of the organization and discussed new plans of organization, finally adopting a new constitution, which will be repeated to the members in annual convention next February for ratification.

Resolutions were passed to the effect that it is the purpose of the association to analyze cost systems scientifically and institute such systems of cost accounting in mills, as to cover all expenses entering into the actual costs of production.

The news division of the association met on October 15 and adopted a plan of organization similar to that of the other divisions. Wilson Ferguson, a man of wide association experience, was appointed permanent secretary of the division and assumed his duties at once.

MANY MEN JOIN COLORS.

The employees of Simens Brothers Dynamo Works have responded with great enthusiasm to the call to arms. A large number of men from their works and offices at Stafford, amounting in all to about 400, have already joined the Forces, and, together with the reservists and volunteers from their head office, branch offices and other departments, the total amounts to over 520. The firm is arranging to keep the posts of all these men open, and ample provision is being made for all the dependents of those who have gone to serve.

PAPER A GOOD GARMENT.

M. Gaston Darboux, the secretary of the French Science Institute, draws the attention of doctors to the value of paper undergarments as a protection against the coming winter weather. The French army in 1870 kept themselves warm by means of newspapers worn beneath their uniforms, and the Japanese soldiers on active service are even now wearing paper shirts.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

Workmen at the plant of the Northwest Paper Company, at Cloquet, Minn., are making the site ready for the construction of the new sulphite mill, which is to be erected this fall and winter. The site of the mill will be just south or down the river from the paper mill. The final plans and specifications from the architects have not yet been received, but they are expected in a few days, and the foundation work will then be started. The work under way this week consists of leveling off and removing the stone from the site of the mill.

* * *

Paper makers are enthusiastic over news that shipments of German wood pulp and papermaking materials are en route to New York. Of the total amount of paper consumed in the United States, 25 per cent has been imported. Right now the demand is greater than the output. Fully 50 per cent of the rags have been imported for the manufacture of fine linen paper, but no rags have come in since the war started.

* * *

A contract was given on Saturday of last week by the Northern Paper Mills of Green Bay, Wis., for a Harper Fourdrinier paper machine to the Beloit Iron Works of Beloit. The bid of the Wisconsin concern was submitted by N. J. North, an officer of the company. The J. H. Horne and Sons Company of Lawrence, Mass., secured the contract for two. Work will be started at once by the Beloit Company on the construction of the machine, and parts of it will be delivered in 60 days. The eastern concern will begin work early on the beaters.

* * *

Organization of the Crown-Willamette Paper Company, with an authorized capitalization of \$13,000,000, has just been completed by Portland, Ore., and San Francisco, Cal., capitalists for the purpose of purchasing the properties of the Crown-Columbia Paper Company, and of the Willamette Pulp and Paper Company operating plants in Washington, Oregon and California. The purpose of the organization, it is understood, is to reduce operating expenses in the paper mills by eliminating a duplication of fixed charges, thus enabling them to compete with British Columbia and Norway and Sweden, which countries have been active in the markets of the Pacific Coast since the removal of the tariff. The principal plant of the Willamette Pulp and Paper Company is at Oregon City, Ore. This mill has a daily capacity of 200 tons. The daily capacity of the various plants to be owned by the new company will be in excess of 450 tons.

According to an opinion by Judge Ray of the United States court at El Paso, N. Y., the Union Bag and Paper Company, the Newton Falls Paper Company, St. Regis Paper Company, Malone Paper Company and Carthage Sulphite Company must pay damages to the American Sulphite Pulp Company, because they infringed on the Russell patent. This invention is an

acid proof cement lining in pulp digesters. The patent expired shortly after the suits were begun.

* * *

A paper exhibit, which was assembled by the Bureau of Foreign and Domestic Commerce of the U. S. Department of Commerce, was shown in Green Bay, Wis., for a week during the middle of October. The exhibit was in the rooms of the Commercial Club. Facts gathered by the bureau on the character and source of the paper supply, market requirements, home production and import trade were presented in an attractive way by the use of manuscripts. The bureau also secured names of the large users of paper, and names of persons who might become agents for American exporters, also over 100 samples were received from many consular officers by the department. The leading paper manufacturers were represented in the exhibit.

* * *

H. S. Wilder of Watertown, N. Y., who, as receiver of the Remington Paper Mills, has made them show up well financially during the past few months, is president of the new three million dollar company which will reorganize the business and take over the properties. The new company is known as the Remington Paper and Power Co. Its capital stock is \$1,575,000, and there will be refunding bond issue of \$1,500,000. Practically all the creditors of the mills—all but a few, who represent only about \$25,000 in claims—have gone into the new company, and the courts will settle with the few within a month. All three mills conducted by the Norwood Paper Co., the Remington Martin Co., the Raymondville Paper Co., will be consolidated, and operated in the future under one head. A large number of the bonds have already been subscribed for. Mr. Wilder is also president of the Diana Paper Co., president of the Harrisville Light and Power Co., and the Malone Light and Paper Co., and will have the active management of the Remington Paper and Power Co. Mr. Wilder says that the new organization means unquestioned strength to the companies, which are now in stronger and better shape than ever before. The daily output of the three mills is about 165 tons, which is said to be the fourth largest production of any one company in the United States.

* * *

That a new industry under the name of the Givan Paper Mills Co., Inc., is coming to Los Angeles, Cal., in the near future is the information received by the industrial bureau of the Chamber of Commerce of that city. This company will engage in the manufacture of various lines of paper. The company is capitalized for \$400,000. Los Angeles capital, together with eastern capital, is behind the plant. It is designed after some of the leading mills of Michigan and Ohio, and will be equipped with the most modern type of machinery. Some of the most skilled makers in the country will be employed there. It is claimed that this plant will be the largest west of Michigan.

THE QUANTITATIVE CHEMICAL ANALYSIS OF PAPER

By HENRY ALDOUS BROMLEY

In The Paper-Maker and British Paper Trade Journal

The materials entering into the composition of paper in its finished state may be classified as follows:—

1. Fibrous foundation.
2. Moisture.
3. Mineral matter.
4. Sizing materials.
5. Coloring matters.
6. Substances added for special purposes.
7. Chemical residues, etc.

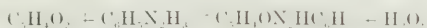
Such of the above as admit of quantitative estimation by chemical means are considered in this article.

The Fibrous Foundation.

The two fibrous materials admitting of quantitative estimation with any degree of accuracy are: (1) Esparto, and (2) mechanical wood pulp.

Determination of Esparto.—This process depends on the fact that the acid distillation of an oxy-cellulose yields furfuraldehyde in direct relation to the amount of fibre present in the paper. The determination is conducted as follows: A flask is prepared through the cork of which passes a stoppered separating funnel and having a glass outlet tube connected with a Liebig's condenser. In the flask is placed 5 gms. of the paper to be examined, cut into small pieces, and 100 c. c. of hydrochloric acid of specific gravity 1.06. The flask is then heated in such a manner that 2 c.c. of distillate per minute are delivered, a graduated measure being used for its collection. When the distillate reaches 30 to 40 c.c. it is removed to a flask, and two or three further portions collected in the same way. As each portion of the distillate is removed from the collecting measure a corresponding amount of hydrochloric acid is added to the distilling flask. The distillation is continued until a drop of the distillate ceases to give the aldehyde reaction with aniline acetate. This reaction is obtained by allowing a drop of the last portion of distillate to fall from a glass rod into a solution of aniline acetate acidified with acetic acid in a white basin. In the presence of an aldehyde a rose red coloration is produced. Failure of the distillate to give the reaction shows that the distillation is complete. The separate portions of distillate are mixed together in a beaker, and the hydrochloric acid present neutralised with a slight excess of sodium carbonate, after which a small quantity of acetic acid is added.

For the precipitation of the furural a solution is prepared containing 12 gms. of phenylhydrazine and 7.5 gms. of glacial acetic acid in 100 c.c. distilled water. This solution is added to the distillate until a drop of the latter ceases to give the aldehyde reaction previously described. The solution is set aside for some hours with occasional stirring for the golden crystalline precipitate of furfural hydrazone formed to separate out, which it does according to the following equation:



The precipitate after being washed is filtered off through a weighed Gooch crucible. The crucible and

its contents are dried in a current of air at about 60 deg. C. and weighed. The weight of precipitate multiplied by .538 gives the weight of furfural. The average yield of furfural from 100 parts of esparto has been shown to be 12.5. The weight of esparto present in the 5 gms. of paper is therefore obtained by multiplying the weight of furfural by 8, whence the percentage weight is easily calculated.

Determination of Mechanical Wood.—Several methods have been suggested for the determination of ground wood in paper. The best known is probably that of Wurster, which depends on the depth of color produced with di-methyl-paraphenylene-diamine. Paper impregnated with this substance can be obtained, together with a scale of colors corresponding to the tints produced by various percentages of mechanical wood. The test paper is moistened and laid between a fold of the paper to be tested. In the absence of mechanical wood the paper is colored red and the tint is then compared with the standard color scale.

The method of Godeffroy and Coulon depends on the property of lignin of reducing a solution of gold chloride to metallic gold. For the estimation a weighed quantity of paper is torn into small pieces and divided into two portions of equal weight. Each portion is boiled for ten minutes in a 10 per cent solution of ammonia, washed, and dried. One portion is now burned and the ash determined. The second portion is treated by boiling with a solution of tartaric acid, followed by extraction with alcohol and ether to remove the size, and is then boiled for a further ten minutes with a 10 per cent solution of gold chloride, being afterwards washed, dried, and finally ashed. On deducting the weight of the ash obtained in the first determination from that obtained in the second, the amount of reduced gold is found. This amount is a measure of the lignone groups present and, therefore, of the amount of mechanical wood. The weight of gold multiplied by 4.7 (the average factor obtained from a number of determinations) gives the weight of mechanical wood in the amount of paper taken for analysis.

In the phloroglucine method of Cross, Bevan, and Briggs advantage is taken of the power of ligneous tissue to absorb a solution of standard phloroglucinol, the amount of absorption being directly related to the quantity of mechanical wood present. The estimation is carried out as follows:—Two gms. of the paper are pulped, dried at 100 deg. C. and weighed. The weighed pulp is transferred to a dry flask, covered with 40 c.c. of a solution made by dissolving 2.5 gms. of pure phloroglucinol in 500 c.c. of hydrochloric acid of specific gravity 1.06, shaken, and allowed to stand for some hours. The liquid is then filtered through cotton wool, placed in the neck of a funnel, and 10 c.c. of the filtrate taken for titration. This 10 c.c. is mixed with 20 c.c. of hydrochloric acid (specific gravity 1.06), heated to 70 deg. C., and titrated with a standard solution of formaldehyde made by dissolving 1 c.c. of 40 per cent "formalin" in 500 c.c. of hydrochloric acid (1.06 specific gravity). The aldehyde so-

lution is added from a burette 1 c.c. at a time with an interval of two minutes between each addition. A piece of cheap newspaper is used as an indicator, free phloroglucinol producing a red stain when a drop of the liquid is allowed to fall on the paper. Towards the end of the reaction it becomes necessary to dry the paper before a Bunsen burner before the stain will appear. Treated in this way one part of phloroglucinol in thirty thousand gives a perceptible stain. When no further color is produced the reaction is complete; 10 c.c. of the original phloroglucinol solution are now titrated in the same way, the difference between the two results giving the amount absorbed by the lignin. The proportion of mechanical wood in the paper is calculated from the following formula:—

$$H = 100 (p - 1.0)$$

$$8 - 1.0$$

Where H = per cent of mechanical wood.

p = absorption value of the dry ash-free sample.

8 = absorption value of mechanical wood.

1 = absorption value of sulphite wood.

Another method depends upon the action of chlorine gas on lignin. The paper under examination is rendered neutral by first boiling with a weak solution of sodium carbonate, treating with weak acetic acid, and then washing with hot water. It is then exposed in a damp condition to the action of chlorine gas, which enters into combination with lignin. After the chlorination is complete the excess of chlorine is removed, and a known quantity of water added, and the resulting hydrochloric acid determined by titration with standard soda. Each c.c. of normal soda used is said to be equivalent to .22 gm. of mechanical wood pulp.

Moisture.

In practice it is usually only necessary to make a determination of added moisture in paper. For such determination it is best to weigh a whole sheet. Dry this at 100 deg. C. in the oven, and then allow the sheet to cool while freely exposed to the atmosphere of the laboratory. The loss of weight gives the amount of moisture over and above that normally present, and is expressed as a percentage on the weight of the sheet.

Mineral Matter.

Determination of the Ash.—One gm. of paper is torn into fragments and incinerated in a weighed platinum crucible, tilted at an angle to allow free access of air. If difficulty is experienced in completely burning off the last charred particles the residue may be moistened with a few drops of ammonium nitrate and the heating continued. When the ash is almost completely white the crucible is cooled and weighed and the weight of ash determined by difference. The ash is expressed as a percentage on the weight of paper taken. Where this weight is 1 gm. the weight of ash gives the percentage figure directly, if the decimal point be moved two places to the right. Thus, .155 gm. = 15.5 per cent.

An alternative method consists in tearing the paper into three or four pieces, and impaling these on the free ends of a piece of twisted platinum wire let into a glass holder. The incineration process is thus somewhat accelerated.

Determination of the Loading and Surfacing Materials.—These may be China clay, pearl hardening, blanc fixe, talc, and satin white, either separately or

in admixture. Where any one loading is present alone its determination is practically identical with that of the ash, after correction for that normally due to the fibrous material of the paper. In the case of pearl hardening (calcium sulphate) and blanc fixe (barium sulphate) some reduction of the sulphate to sulphide takes place on ignition, and the ash requires moistening with sulphuric acid and reheating before its weight is determined. Loading materials contain more or less water which is driven off at a red heat, and this loss should be allowed for in the calculation. Thus pearl hardening normally contains two molecules of water (20 per cent) and China clay about 12 per cent.

Pearl hardening and satin white in admixture with other loadings are easily separated from them by reason of their ready solubility in dilute hydrochloric acid. For the determination of blanc fixe, talc, and China clay the residue after ignition is fused with several times its own weight of fusion mixture in a platinum crucible. By this means the bases are converted into carbonates, while the sulphates and silicates enter into combination with the sodium and potassium of the fusion mixture. The fused mass is treated with hot water for some time to dissolve out the soluble sulphates and silicates, after which the liquid is filtered and the filtrate set aside for determination of the acids. The insoluble residue, which may contain barium, aluminium, and magnesium carbonates, is dissolved in dilute hydrochloric acid and the solution reserved for determination of the bases.

The filtrate reserved for the determination of the acids as above is acidified with hydrochloric acid, evaporated to dryness, moistened with more hydrochloric acid, heated for a short time on the sand bath, and the residue taken up with hot water. This causes the separation of silica which is then filtered off, washed, dried, ignited and weighed. The filtrate from this last operation is heated to boiling, and sulphates, if present, precipitated with barium chloride in the usual way, filtered, and the precipitate washed, dried, ignited and weighed.

The solution reserved for the determination of the bases is treated with strong ammonia to precipitate alumina, which later is filtered off, washed, dried, ignited, and weighed. The filtrate from this last operation is treated with ammonium sulphate to precipitate barium, which is then ignited and weighed as barium sulphate. The final filtrate is evaporated to small bulk, half its volume of ammonia added, then excess of a solution of sodium phosphate, and any resulting precipitate estimated as magnesium pyrophosphate in the usual manner.

Sizing Materials.

Determination of Gelatine and Casein.—These bodies being nitrogenous and containing fairly constant proportions of nitrogen, their estimation resolves itself into a determination of nitrogen. The determination may be made by either of two methods, viz., by combustion with soda lime or by Kjeldahl's process. The latter being the simpler and more generally employed process is the one described here. Kjeldahl's process depends on the fact that when most nitrogenous bodies are heated with excess of concentrated sulphuric acid their nitrogen is converted into ammonium sulphate, from which the nitrogen may be liberated by treatment with excess of alkali and distilling. Into a special hard glass flask is introduced from 1 to 2 gms.

According to the probable proportion of gelatine present) of the paper torn into shreds, followed by about 20 c.c. of concentrated sulphuric acid (free from ni-

trous compounds) and .5 gm. red mercuric oxide. The flask is supported by the neck in an inclined position and gradually heated up to nearly the boiling point of the acid. At this stage 5 gms. of potassium sulphate are added to raise the boiling point, and the heating is continued. The liquid is at first black, but becomes lighter in color as the reaction goes on, passing through brown to yellow, and finally becoming almost colorless. The reaction usually takes several hours to complete, but once started may safely be left to itself. A crystal of copper sulphate added during the later stages will hasten completion. When the nearly colorless contents of the flask are cold they are diluted with a considerable bulk of water, and transferred to a 500 c.c. copper distilling flask, together with enough of a 50 per cent solution of caustic soda to render the liquid alkaline, 20 c.c. of a weak solution of potassium sulphide, and one or two pieces of broken clay pipe stem or pumice. A special bent delivery tube arranged to act as a condenser is used, fitted into the cork of the distilling flask, the other end dipping into a graduated measure containing a

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known volume (about 20 c.c. of) sulphuric acid.

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The liquid in the flask is now rapidly distilled for about half an hour, by which time all the ammonia will have come over. Care must be taken so to regulate the heat that neither the liquid in the flask tends to be driven over into the delivery measure nor the acid be sucked back into the flask. The distillate is cool-

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ed and an aliquot portion titrated with = alkali, using

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methyl orange. The number of c.c. of alkali required for the whole 20 c.c. of acid deducted from 20 gives the number of c.c. of acid neutralised by the ammonia. Each c.c. of this neutralised acid corresponds to .00139 gm. of nitrogen, and the figure thus obtained multiplied by 556 and divided by the weight of paper taken gives at once the percentage of "bone dry" gelatine present. In the case of casein the factor is .490. A blank experiment using a paper free from gelatine should in all cases be done side by side with the above for the purpose of testing the reagents, etc. (even the air of the laboratory may invalidate the results by the presence of ammonia). Any neutralisation of acid obtained in the "blank" must be deducted from the figure obtained in the main experiment.

Determination of Rosin.—The difficulties in carrying out an accurate determination of rosin in paper are great. Many methods have been proposed, but most of them are more or less unreliable. The simplest is perhaps that based on the turbidity produced on diluting an alcoholic solution of rosin with a considerable bulk of water. The paper under examination is extracted with alcohol (not methylated spirits) and the extract poured into water in a tall glass cylinder. An opalescent turbidity is produced, due to the precipitation of free rosin, which turbidity is compared with that produced by an alcoholic solution containing a known weight of rosin. The results obtained by this method are very variable, since other bodies liable to be present are precipitated at the same time—notably, fatty acids from the soap often used in manufacture. The presence of more than 6 parts of rosin in 100,000 is further said to interfere with the delicacy of the reaction.

In Schumann's method the rosin is extracted by digesting with dilute alkali, precipitated with dilute sulphuric acid, filtered off, washed, dried, and weighed.

Owing to the difficulty in completely removing the alkaline resinates formed the method is unsatisfactory, giving low results. The alkali, like alcohol, also extracts other bodies besides rosin.

The following method has been recently proposed by C. F. Sammet of the Bureau of Chemistry, Washington, who claims the results to be within the experimental error of .2 per cent. Five grammes of paper are cut into strips folded and extracted in a Soxhlet with acidified alcohol (100 c.c. of 95 per cent alcohol with 15 c.c. of a 5 per cent solution of acetic acid). The solvent is allowed to siphon over from 6 to 12 times, after which the alcoholic extract is washed into a beaker, evaporated to small bulk, taken up with 25 c.c. of ether, and transferred to a separating funnel containing 150 c.c. of distilled water and a little salt to prevent emulsification. The contents of the funnel are well shaken, the water drawn off, and the process repeated. The combined ether extracts are then washed with distilled water to remove water-soluble salts, and the washed extract transferred to a platinum dish, the ether evaporated, and the residue dried in the water oven at 98 deg. to 100 deg. C. for one hour exactly, after which it is cooled and weighed. Fatty and waxy matters removed in the process are in too small proportions to affect the accuracy of the result.

Determination of Starch.—Wurster's method for the determination of starch consists in first extracting rosin by treatment of the paper with absolute alcohol, acidulated with hydrochloric acid, and then drying and weighing the paper. The latter is now boiled with a solution consisting of equal parts of alcohol and water, also acidulated with hydrochloric acid, dried, and again weighed. The difference in the weightings represents the starch present. The method is open to objection for the following reasons, viz.: firstly, the alcohol extracts matter in excess of the rosin, and, secondly, the starch is probably never completely removed by any process of simple solution.

The most satisfactory plan yet devised consists in converting the starch into soluble sugars and then determining these. Two methods are available. In the first the conversion is effected by means of malt extract or diastase, a weighed quantity of paper being first extracted with alcohol to remove rosin, dried weighed, and then treated with malt extract at a temperature of about 60 deg. C. for half an hour to an hour. The glucose and maltose formed may be estimated directly in the manner hereafter described, or the paper may be carefully washed, dried, and again weighed, and the difference in the two weightings taken as starch.

The second method depends upon the power of dilute acids to convert starch into glucose. Five grammes of paper are boiled with 500 c.c. of distilled water for 30 minutes, and then thoroughly pulped. Sulphuric acid is now added to the liquid in the proportion of 2 per cent of its weight, and the whole is heated on the water bath under a reflux condenser for three hours, or until the liquid gives no further blue color with dilute iodine solution. At the end of this time the liquid is filtered, a slight excess of caustic soda added, the filtrate made up to a litre, and 200 c.c. taken for the direct estimation of sugar which may be performed either (1) gravimetrically or (2) volumetrically. Each process is on occasion useful and both will therefore be described. In each case the reagent used is Fehling's solution, which is prepared by dissolving 34.64 gms. of pure crystallised copper sulphate in distilled water and diluting to 500 c.c., while 70 gms. of caustic soda and 180 gms. of re-crystallised

potassium sodium tartrate (Rochelle salt) are dissolved in about 100 c.c. distilled water and the solution also diluted to 500 c.c. The two solutions are mixed in equal proportions just before use. From this mixture the reducing sugars possess the power of precipitating red cuprous oxide in proportion to the amount of sugar present.

For the gravimetric estimation to 20 c.c. of Fehling's solution at the boil is added the 200 c.c. of filtrate from the acid treatment of the paper, and the whole boiled for a further ten minutes. The red precipitate formed is filtered through a Gooch crucible, washed, ignited, and rapidly weighed as cupric oxide. The weight multiplied by .4535 gives the weight of glucose in the 200 c.c. of filtrate. The amount of glucose in the whole litre of filtrate multiplied by .9 gives the weight of starch present in the 5 gms. of paper.

For the volumetric estimation, 10 c.c. of Fehling's solution diluted with water are boiled in a beaker, and while boiling the sugar solution, of the same strength as in the gravimetric process, is run in from a burette until the blue colour of the Fehling's solution is completely discharged. In practice it is not easy to determine the end point of the reaction, and it is therefore better to employ an indicator. For this purpose a drop of a solution of potassium ferrocyanide acidulated with acetic acid is placed on a white tile or spotted on a filter paper, followed by a drop of the liquid from the beaker. While any unreduced copper remains in the latter a brown precipitate—or stain—will be produced. The number of c.c. of sugar solution used is then read off and will correspond to .05 gm. of glucose since this amount is the weight of glucose capable of completely reducing 10 c.c. of Fehling's solution. The amount of starch present in the 5 gms. of paper is calculated as follows:

$$.05 \times 1000 = .9$$

No. of c.c. of sugar sol. used

Coloring Matters.

Smalts, existing as it does in high-class papers, usually without admixture with loading materials, can be estimated with sufficient accuracy by incinerating the paper, weighing the ash, and making a correction for the small proportion of the latter due to the fibre, etc. This proportion does not usually exceed 2 per cent. The ultramarines are of variable and even doubtful composition, and are therefore best estimated by comparing the depth of color of the ash with that of standard mixtures of the pigment with known proportions of China clay. Chrome yellow, orange, etc., also of variable composition, may be determined, if necessary, by estimating the lead and chromium separately, and calculating the results to the nearest indicated composition. It is scarcely necessary here to describe the full gravimetric process as it is likely to be but rarely required. It will be sufficient to say that the lead is precipitated and estimated as the sulphate, and the chromium as chromic oxide. Prussian blue may be determined approximately by estimating the iron by igniting the paper, fusing the ash with sodium carbonate, treating the fused product with hot water, filtering, and boiling the residue with dilute hydrochloric acid and a drop or two of nitric acid. The solution is then again filtered, and the iron and alumina precipitated with ammonia in the presence of a little ammonium chloride. The precipitate of iron and ammonium hydrates is washed, filtered off, and digested with excess of caustic soda, then filtered again and

carefully washed. The residue, which consists entirely of iron, is washed, dried, ignited, and weighed as the oxide. This process also serves for the estimation of all other iron pigments except the natural colors, ochres, etc.

Substances Added for Special Purposes.

Oils and Fats can be estimated by extracting with ether, evaporating the solvent, and weighing the residue.

Paraffin Wax.—Similarly to the above using benzene or petroleum spirit.

Salicylic Acid.—This substance is used as a preservative in papers required for wrapping foodstuffs. It is extractable with petroleum ether, and may be estimated in the solution by diluting the latter with an equal volume of 95 per cent alcohol and titrating with N

—alkali using phenolphthalein as indicator. Each c.c. 10

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of — caustic soda is equivalent to .0138 gm. of salicylic 10
acid.

Carbolic Acid.—The estimation of carbolic acid in carbolised wrapping paper is frequently required. Commercial carbolic acid consists chiefly of cresylic acid with higher phenols, but little real phenol being usually present. Since, however, cresol is probably as efficient as antiseptic and insecticide for ordinary purposes as phenol the absence of the latter body is of little importance. Carbolic acid may contain tar oils, which are, however, quite inert. Naphthalene is also liable to be present.

For the estimation of commercial carbolic acid the bromine absorption method in use for the determination of phenol is valueless. The writer has found the following method, which is based on a process originally described by Muter, quite satisfactory. From 10 to 20 gms. of paper (according to the probable proportion of acid present) are cut into pieces and extracted with a sufficient quantity of alcohol (95 per cent) in a Soxhlet. The extract is transferred to a basin, mixed with about half its volume of a 10 per cent solution of caustic soda, and the mixed liquids evaporated in the water bath to small bulk. Tar oils and naphthalene, if present, here separate out and may be removed by filtration. The liquid is now transferred to a separating funnel and hydrochloric acid added cautiously and with gentle shaking until the liquid shows an acid reaction. Means should be taken to prevent the mixture becoming too hot during the process. A little brine is now added. The liberated tar acids rise to the surface of the liquid which also becomes milky from the precipitation of rosin. The whole is now set on one side for a short time to complete the separation of the layer of tar acids, after which the rosinous liquid is drawn off as completely as possible. The residue of oil is shaken up with ether or petroleum spirit, transferred to a weighed flask, the solvent evaporated off, and the residue weighed.

Chemical Residues and Dangerous Substances.

Bleach Residues.—Excessive quantities of chlorides are the most indications of faulty treatment of bleach residues and of insufficient washing. For the estimation of soluble chlorides the paper is extracted with hot distilled water and the solution evaporated to small bulk. To the resulting liquid is added while stirring silver nitrate solution till no further precipitate occurs, followed by a little nitric acid. The precipitate is al-

lowed to settle, and the clear liquid is decanted through a filter. The bulk of the residue is now carefully washed several times with boiling distilled water to free it from acid, and is finally collected on the filter, and the whole dried in the water oven. The chloride is scraped from the filter, transferred to a weighed crucible, and heated at a low temperature until it commences to fuse. The filter is ashed separately on the crucible lid, and the ash treated with a drop of aqua regia, the resulting chloride being dried and added to the residue in the crucible. The weight of chloride multiplied by .248 gives the total chlorine.

Alum.—For the estimation of alum the paper is extracted with hot water, rendered slightly acid with a drop or two of sulphuric acid. The alumina is then precipitated with ammonia and estimated as described under "Loadings."

Acidity.—The total acidity of a paper is estimated by titrating a distilled water extract with $\frac{N}{10}$ alkali, using litmus as indicator.

Soluble Sulphur Compounds are determined by extraction with distilled water and titration with $\frac{N}{10}$ iodine solution as described in "The Paper-Maker" Vol. xlviii, No. 2, page 246.

Arsenic. An estimation of this substance is occasionally required, as where it forms the base of a coloring matter, or as in flypapers, etc. Where a relatively large quantity is available and is present as arsenious acid (as it frequently is) it may be estimated by extracting with a boiling solution of sodium bicarbonate and titrating the extract with $\frac{N}{10}$ iodine and starch. Each c.c. of $\frac{N}{10}$ iodine corresponds to .0049 gm. of arsenious acid.

Where minute quantities of arsenic only are present (or available) the following process is necessary: The paper is first heated for some time with a mixture of sulphuric and nitric acids in the proportion of 30 parts to 1. The carbonised residue is boiled with distilled water and filtered. An apparatus is prepared consisting of a flask provided with a stoppered funnel and having an outlet connected to a drying tube containing calcium chloride, and leading to a hard-glass tube having a piece of wire gauze wrapped round it near the middle, and heated by a Bunsen under the gauze. The arsenic extract is introduced into the flask via the stoppered funnel after 2 to 3 gms. of arsenic-free zinc and some pure hydrochloric acid have been placed in the flask. A mixture of arseniuretted hydrogen and hydrogen is evolved which is split up on reaching the heated portion of the tube and deposits a mirror of metallic arsenic in the cooler portion of the tube. This mirror is compared with those produced by solutions containing known amounts of arsenic. A "blank" experiment must always be performed in order to test the purity of the reagents.

The only son of Mr. Arthur MacFarlane, President of the United Wire Works, Ltd., is going to the front as a regular in the British army.

British Trade News

London, October 4th.

There is a greater confidence and a stronger feeling for business now prevailing in the British paper trade, and wood pulp trade. Every manufacturer is on the alert for new markets, because the German and Austrian mills are practically standing idle. In Germany alone up to 30 mills that produce kraft have had their markets suddenly cut off and, to add to their troubles, the military system of the "Fatherland" has monopolised most of the workers who are now under arms. All over the United Kingdom—and let us hope the same may be said of Canada—there is a great movement to supplant our enemy's trade, and various devices have been introduced to meet the new state of things. Advantage is being taken of the Patents, Designs, and Trade Marks Acts, under which licenses are granted to alien enemies. Messrs Bertram, Ltd., of Edinburgh, the well-known papermakers' engineers, have applied for permission to manufacture the calendering apparatus patented by Schumann, of Dusseldorf, in 1911, and the application will be heard before the Patents Court about the 16th or 17th of October. Messrs. C. Wainman and Co., Ltd., also papermakers' engineers of renown in Canada and England, and Messrs. Jas. Brown and Co., Ltd., Esk Mills, Penicuik, are applying for permission to utilise the process of manufacturing backings for printing illustrations, patented in 1903 by Laukes and Schwarzer.

The only fear that paper manufacturers have is the threatened shortage in colors and dyes. Aniline colors cannot be exported now to any place, or anything with the name of aniline. This is partly due to the great demand in the textile trade which is very busy night and day on military clothing. Dyes are consequently extremely expensive for paper mills, and the wall paper and paper hangings mills feel the pinch more than any other concern. In dyes and dyestuffs, of course, Germany has excelled all other countries. The Germans are able to put a tremendous amount of technical and practical information at the disposal of their customers, which has been one of the great inducements for English buyers to deal with a German chemical firm. At present no English house is hawking its goods, or needs to. Chemicals sell themselves. The fact that the Germans produce a larger selection of products, and a greater variety of shades in colors and qualities has always told in their favor. There is a great wave passing over England now over the dyes question, and everything points to a big expenditure of money in promulgating new industrial concerns. It is contended that what English color firms could do best is to concentrate in the future upon the manufacture of new colors of valuable individual qualities. Possibly this will be done.

The London newspapers have published an interview a Montreal correspondent has had with Mr. Dubuc, the managing director of the Chicoutimi Pulp Company. Mr. Dubuc says that an example of the manner in which German trade is now going to England could be furnished by himself. In the past he had sent large quantities of pulp to Germany which was made up into paper for the North American trade. This trade was now killed, all of it going to the English manufacturers. "If British manufacturers," he added, "seize the opportunities presented to them it will inevitably mean that by the end of the war an enor-

mous amount of the world trade which was formerly in the hands of the Germans will be annexed by Great Britain." Mr. Dubuc's company already enjoys a splendid pulp connection in England—in fact the shipments from Chicoutimi should be a splendid example to other Canadian producers. Mr. Dubuc is in a position to survey the present state of affairs, owing to his first-hand knowledge of the pulp situation in times of peace that prevails in Europe as well as in Great Britain. The Paper Makers' Association of Great Britain and Ireland and the Board of Trade are working conjointly in the movement to capture what Germany cannot supply in paper, and, incidentally, it may be pointed out that this is where a government department proves useful, its national influence and scope being in many respects invaluable for accuracy and up-to-date reports on market conditions.

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Last year the Pulp and Paper Magazine published a speech, delivered in London by Lieut.-Col. the Hon. P. Pelletier, Agent-General (in London) for the Province of Quebec. I had the pleasure of listening to the speech, which was in the nature of an appeal to induce English capitalists to invest their money in the lumbering and pulp industries of Canada. Mr. Pelletier is now prominently before the public in England on the same subject and he hopes to succeed in attracting the attention of the capitalists in time. He has issued the following timely notice:—"The present time also offers rich rewards to anyone who will establish paper and pulp mills in Quebec. The existing plants are unable to fill the orders they have on hand. There is an abundant supply of cheap water power available—in fact, in some cities it is practically given away to new companies who will establish bona fide industries." Mr. Pelletier has a great admiration for the English capitalist and if he does not succeed it will not be his fault. He is constantly throwing out the warning about the "longing eye" American capitalists are throwing on Quebec pulp wood.

* * *

The 40th ordinary general meeting of the shareholders of C. Davidson and Sons, Ltd., Mugemoss Paper Mill, near Aberdeen, in Scotland. Mr. Alexander Davidson presided. The annual report showed that the balance of profit and loss account was £541 10s 2d, which was left to the credit of that account. The directors recommended that £1,000 be written off for depreciation by transferring that amount from the special reserve fund. The report also stated that the unsatisfactory result for the year was accounted for by: (1) the excessive price of coal, amounting to an increase above ordinary years of approximately £2,200; (2) the shortage in water power through the low state of the river supplying the mill for a considerable part of the year; (3) the high cost of raw materials, freight and carriage, without a corresponding increase in the price of paper; and (4) the great scarcity of female labor, which, however, had recently been overcome. Mr. Davidson said, when dealing with the accounts for the information of the shareholders, that the sales of the mill were about one per cent less than the corresponding and about one per cent more than the year before. A shareholder pointed out that a company with a capital of something over £80,000 and an increased coal bill of something over £2,000 did not give sufficient reason, even taken along with other explanations, for non-payment of a dividend. One year it was a coal strike, another year floods on the river

Don, and another year accidents to machinery. Mr. Davidson said it was very unfortunate they were unable to pay larger dividends. There were periods when many excellent businesses have had to suspend the payment of dividends for a longer time than the Mugemoss Mill, and afterwards they had become very prosperous.

* * *

Seeing that Canadian interest is being aroused in the Japanese market for pulp and paper, it should be stated that the British consul sent to London a report some weeks ago stating that it would not be long until Japan would be in a position to manufacture all her own paper. The paper industry was in a good condition, but, of course, high grade papers were mostly imported. It is in pulp that Japanese trade can be developed and in this respect Canada should stand out before any other nation or country. There is a shortage of pulp at present in Japan and Scandinavian exporters have received telegrams to send all they possibly can.

* * *

British papermakers are to be found in all the big battles being fought in France. When the German submarines sank the "Cressy," "Aboukir," and the "Hague," three cruisers in the North Sea, a papermaker was aboard the "Aboukir." For three and a half hours he was in the water with a lifebelt and was saved. He also succeeded in saving three comrades. The National Union of Paper Makers have done the rescuer and survivor, who by the way, is named Burrhuck, high honour and showered congratulations on him on his escape from death.

British paper mill owners are giving their old wet suits in the mills to the army for use as blankets or horse covers.

On the 5th November, the Autumnal Meeting of the British Papermakers' Association will be held in London.

LOCKWOOD'S TRADE DIRECTORY.

The publishers of Lockwood's Directory of the Paper, Stationery and Allied Trades of America, have favored the Pulp and Paper Magazine with a copy. The production is in every way a tribute to the enterprise and efficiency of the Lockwood Trade Journal Company, who have long been known as leaders in their own particular branch of the publishing business. This year, the publishers anticipate a welcome quite equalling that accorded the 1914 edition, not one copy of which remained unsold. The classified list of paper and pulp mill products in the United States and Canada has had the closest attention, and about one thousand new names have been added. In all other departments there has been the same careful attention to accuracy.

After all, this is the main point in a directory, and for the sake of reliability an investment in such an excellent work should return itself with high dividends in satisfaction.

Copies may be had of the Lockwood Trade Journal Company, 150 Nassau Street, New York, at \$3.00.

WANTED. Position as officiating millwright and caretaker of paper machines, thoroughly qualified and reliable, best of references. Apply, "Unemployed, Pulp and Paper Magazine, Read Building, Montreal."

PULP AND PAPER NEWS

Donald McLean, late manager of the E. B. Eddy Company's branch at London, Ont., has removed to Toronto and entered upon his new duties, succeeding James Logie who has been manager of the Toronto branch for the past five years, but will remain with the company a few weeks yet, when, it is understood, that he will embark in the paper jobbing business. Allan M. McLean has succeeded his father as manager of the London warehouse of the Eddy Co.

John Lane, the widely known publisher of London, England, has been spending a few weeks in Montreal, Toronto and other cities, and reports that business which was at first upset by the outbreak of the war, is now back to normal in nearly all lines. National confidence in Great Britain has been restored and the publishing trade has not materially been affected. There has also been no diminution in the sale of fiction. Mr. Lane reports that he has found in Canada a growth in the requisition for English books. In the matter of gift volumes for the Christmas trade he believes there will be no falling off and, while in the past a large percentage of these books have been made in Germany, the English houses are working to full capacity to meet the orders.

The roof is now being placed on the new paper mill of the Abitibi Power and Paper Co., at Iroquois Falls, Ont., and plans have been laid for a modern town of three thousand people at this point. It is confidently expected that the industry will be turning out news print not later than June next when the output will be two hundred and thirty tons per day. Sixty thousand cords of spruce are now being used annually in the pulp mill, which is turning out about one hundred and sixty tons per day, and when the Temiskaming and Northern Ontario railway raises certain bridges along the line, the head of water at the dam will be raised six and a half feet, when the production of ground wood pulp at the plant, by reason of the operation of more grinders, will be increased about twenty-five per cent. When the paper mill is running there will be no ground wood sold, and the company will use some ninety thousand cords annually. There will be employed in the plants between six and seven hundred men besides the army in the woods.

Fred Duncan, Secretary-Treasurer of the Provincial Paper Mills Co., Toronto, has returned from spending a few days in a duck shooting expedition to Lake St. Francis on the St. Lawrence River. He has splendid luck. This is the only holiday which he ever takes.

William F. Robinson, who for many years was the representative of the Laurentide Paper Co. in Great Britain, has been appointed Manager of Sales for Price Bros. and Co., Jonquiere, and has entered upon his new duties.

The new half million dollar plant of the Beaver Companies is now in operation in Thorold, Ont., making the second factory that they have built and equipped in

Canada within the last few years. The output of Beaver Board made from pure wood fibre at Thorold will be from sixty to seventy tons daily, and the plant is a model in every respect. Mr. Wright, late with the Union Bag and Paper Co., Glenn's Falls, N.Y., is the superintendent and the industry will be conducted under the name of the Beaver Wood Fibre Co., Limited, a charter having been granted during the past few days. The capital stock is one million dollars, divided into ten thousand shares of one hundred dollars each. Under the charter the company has wide powers, and may engage in practically all branches of the pulp and paper trade. The wood fibre machine is equipped with sixty dryers, and is said to be the largest of its kind in the world. It was built by Rice, Barton and Fales Machine and Iron Co., of Worcester, Mass., and extending the length of the main building of the plant, the dimensions of which are 350 x 150 feet. There is an extension to the north end of 150 feet by and to the south another addition of 150 feet x 150. The buildings are all of concrete and steel, of the factory type, with numerous windows and sky lights. The beater room, the grinding department, the motor room, the boiler house and the offices are the last word in construction and efficiency, and yet it is only a little over a year ago that the first sod was turned. The engineer in charge of the work was E. E. Whitney. The Grand Trunk has a siding running down to the plant, while the shipping facilities by both rail, and water on the Welland Canal, could not well be surpassed. The new industry is an important contribution to the town of Thorold as a pulp and paper centre, and no place in Canada has made greater progress during the past three or four years than this thriving community.

R. M. Myers, who was treasurer of the Garden City Paper Co., St. Catharines, Ont., and also treasure of the L. H. Gardner Paper Co., of Munford, N.Y., died suddenly in his office in Rochester, N.Y., on October 24. He was 72 years of age, and a wealthy business man, and banker. Heart failure was the cause of his death.

HOIST AND CRANE BULLETINS.

The Canadian General Electric Company has issued two most interesting booklets, No. 906, dealing with Electric Hoists designed to fill the gap between the hand chain block and the travelling crane, and No. 48,700 on Sprague Electric Monorail Cranes, respectively. Both brochures are full of information of the greatest interest to the manufacturer having loads of any kind to raise. The Monorail Crane offers many advantages such as saving in floor space, travelling at high rate of speed, avoiding of confusion, etc. The company believes that the care in design, and manufacture, combined with the thorough testing given their apparatus, that the product is as near perfection as can be obtained by human agencies.

A NEW PAPER WEIGHT GAUGER.

A paper weight gauger, for which a patent has been applied for in both the United States and Canada, is now on the market. The gauger automatically regulates the weight of paper running over the machine and also gives an automatic regulation of the pulp supply, so that a regular amount is delivered for any given weight of paper being made. This automatic weighing of the pulp takes place at the fountain head or near by to the pulp service chest. The paper weight gauger enables the paper maker to reduce to a minimum the variation in the substance of any weight of paper that he may be running and to do away with one of the greatest of complaints from customers. By virtue of this invention the paper maker is certain of the exact number of pounds per ream and the newspaper press of the world will now be assured of getting number of copies from a given weight of paper, a thing that has never been sure of in the past.

It is claimed that this attachment, when once applied to the paper-making machine, will remove many claims made by the printer on the mill owner. It also enables the machine tender to change from one substance to another, with the least possible quantity of paper made, varying say between double demy, 32 pounds which he is running, and double demy, 50 pounds when he wants to begin on. If the gauger is at once set working to the latter weight, the paper making machine will give off that substance until the order is completed. If for any reason, the machine is shut down, the pulp is shut off behind the paper weight gauger and, whenever the machine is ready to start again, all the tender has to do is to turn the pulp supply on to the paper weight gauger and the paper will be found to come automatically on the reel the same substance as before the shut-down.

This invention is most essential in the making of thin catalogue papers, which in almost every case have to meet postal regulations as to a given weight. Many a mill owner has had to meet heavy claims for over-weight owing to his paper being slightly over the weight allowed for a certain postage rate per pound. The paper weight gauger or pulp regulator has been tried out in several of the largest mills in Great Britain during the past few months and in each instance has given satisfaction. As a proof of its efficiency, certain mills all ordered one and, after a thorough test installed them on their other machines.

The paper weight gauger is perfectly simple and does not entail very much alteration to the paper making machine—in fact it can be attached to any machine at the week's end.

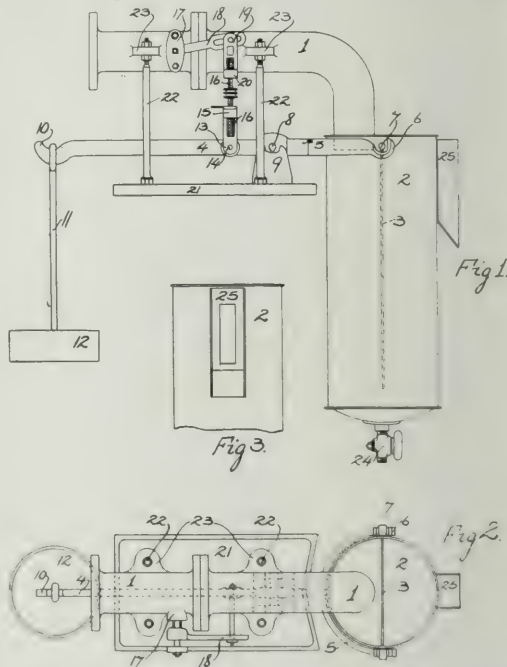
The sole rights for the manufacture and sale of the paper weight gauger are in the hands of J. L. McNicol, of Georgetown, Ont., who has had fifteen years experience as superintendent and manager of several of the largest and most up-to-date pulp and paper mills in Canada, Great Britain and India.

The object of the weight gauger, which was invented by George Drummond, of Oswaldtwistle, Lancashire, is as stated to provide a device by means of which the weight or density of the material passing from the service chest can be automatically regulated and an even, continuous flow of any required density maintained so as to insure a uniform weight throughout the paper ultimately manufactured.

With this and other objects in view, the invention consists in certain novel details of construction, and combination thereof. The invention is fully described with the aid of the accompanying drawings in which similar parts are similarly designated in all the views.

Figure 1 shows an elevation of the weight gauger; Figure 2 is a plan, and Figure 3 a detail.

1 represents a supply pipe leading into the receiving vessel 2, which is divided longitudinally throughout most of its length by a plate 3. The vessel 2 also has a vertical elongated outlet 25, tapered inwards from the mouth and a wash out cock 24 at the bottom. A beam 4 is supplied with substantially semi-circular ends 5, which encircle the sides of the vessel 2, the said ends being provided with hook shaped members 6, on which the supporting arms 7, integral with the sides of the vessel 2 rest. The beam 4 is fulcrumed on a knife edge, or other outside bearing 8 mounted on the bracket 9, which rests on the frame 21. The said frame is supported by means of rods 22 hung from flanges 23 integral with the pipe 1. On the outer end of the beam 4 and integral therewith is a hook 10 from which a weight holder 11 carrying a weight 12 is sus-



ended. A link 13 is pivotally mounted on the beam 4 by means of a pin 14, the said link having a sleeve 15 tapped to receive the coupling screw 16. A valve 17 is operated by a slotted arm 18, in which the link 19 is slidably mounted. The said link 19 also has a sleeve 20 tapped to receive the other end of the screw coupling 16, which is provided with right and left handed threads at its opposite ends to permit of variation in the length of the connection between the beam 4 and the allotted arm 13.

The method in which the device is operated is as follows: the amount of pulp passing through the supply pipe 1 and receiving vessel 2 into the service chest is automatically regulated by means of the weight in the receiving vessel; overbalancing the weight 12 at the other end of the beam 4, and operating the valve 17 by means of links 13 and 19 and screw coupling 16. The weight 12 can be of any required size to permit of the desired quantity of pulp passing into the vessel 2 before the supply is automatically cut off by the valve 17.

Ottawa Notes

Ottawa, Ont., October 25—The grim spectre of low water still haunts the bedsides of pulp and paper manufacturers operating on the Ottawa River. Nearly every week sees some lumber or paper mill either shutting down or curtailing the extent of its activities as a result of the gradual shrinkage of supply. Fraser and Company, of Deschenes, and McLachlin Brothers, of Arnprior, on the upper part of the river, are among the latest mills to close down and it is now stated that of all the lumber and paper companies which obtain their power from the Ottawa the W. C. Edwards Company and Gilmour and Hughson are the only two large mills which are still operating at anything like capacity.

The J. R. Booth firm is now buying practically all the pulp which is necessary to keep its paper mills supplied. Last year the firm bought some pulp on account of low water but a larger supply will likely be required this season as there is little chance of operating the pulp mills and every effort is to be made to keep the paper mills in operation as long as possible.

The E. B. Eddy Company is also greatly inconvenienced. According to Mr. George H. Millen, joint manager of the concern, there is still no improvement in the situation and the water is now lower than any previous known record. The firm has already commenced to buy pulp and is procuring it mostly from Abitibi district.

Mr. Millen estimated to your correspondent that the paper mills of the company were at present operating at only about 50 per cent of capacity; the ground-wood mill at about 20 per cent while the sulphite mill is operating full blast. If it were not for the new power plant installed last year, however, it is not likely that the Eddy mills would be able to operate at all. The company considers itself very fortunate that in this year of record low water and exceptional news print opportunities, its power development enables it to some extent to meet the situation.

An order in council has been passed by the Government putting into effect new regulations governing the cutting of timber on school lands in Canada. The effect is considerably to increase the license fees to be charged for the timber. Hitherto the same regulations have applied to timber cut on what are known as Dominion lands and school lands. However, the timber dues on Dominion lands were purposely made low to enable the settler to obtain timber for his barns and fences cheaply whereas from the school lands, which are an endowment for educational purposes in the prairie provinces, as large a revenue as possible is desired. Under the new schedule of rates it appears that 10 per cent of its sale value will be charged for timber cut for pulpwood.

Canadian paper manufacturers who may have fancied that a recent modification of the regulations governing trading with the enemy implied that German paper products or chemicals used in the manufacture of pulp and paper might be imported into Canada if received through United States ports will be undeceived by a statement issued by the Canadian Customs Department. It is to the effect that no goods of German or Austrian manufacture will be admitted into Canada even through neutral ports. Attempts have been made by agencies in the United States of German paper manufacturers to create an impression in the minds of their Canadian customers that they

could supply them as usual. A statement also appeared in the New York Paper Trade Journal to the effect that this would be possible through recent amendments to the proclamation forbidding trade with the enemy. However, such is not by any means the case and Canadian manufacturers who find themselves inconvenienced by the lack of certain raw materials of German origin would do well to endeavor to find substitutes in Canada.

This, no doubt, will be considerably facilitated by the new regulations permitting the suspension or avoidance of German or Austrian patents held in Canada. All that is necessary is for the applicant to show that he is prepared to manufacture the patented article and that it is for the general good that he be allowed to do so. Already a number of such applications have been made and among their number will in all probability be some on the part of Canadian manufacturers who desire to supply the demand in Canada for certain raw materials for paper making of the kind mentioned. —Mac.

TRADE INQUIRIES.

The following inquiries have been received by the Department of Trade and Commerce, on application to whom, quoting numbers, those interested may obtain full information.

1038. **Paper.**—Large Bordeaux newspaper with daily circulation one hundred and fifty thousand, willing to purchase twenty thousand dollars print paper about fifty inches long, payment conditions determined later. Quotations desired Havre or British port.

1043. **Wood Pulp.**—A Birmingham firm is open to consider quotations on sulphite.

1044. **Printing Paper.**—A Nottingham firm is open to receive quotations and samples of printing paper.

1045. **Wood Pulp.**—A London firm using thousands of tons of mechanical and sulphite pulp annually is open to receive offers c.i.f. London.

1046. **Mechanical Wood Pulp.**—A Sheffield firm is open to receive quotations.

1047. **Pulp Wood.**—A West Hartlepool firm inquires for pulp wood in quantities from 4,000 to 5,000 English fathoms of 216 cubic feet, 4-inch top and upwards, of white wood free of bark and bast.

1048. **Wood Pulp.**—A West Hartlepool firm inquires for quotations on sulphite, soda and mechanical pulps for 500 tons each of the former two, and 100 tons of the latter.

1049. **Printing Paper.**—A Nottingham firm inquires for quotations, sample on file at Department of Trade and Commerce, Ottawa.

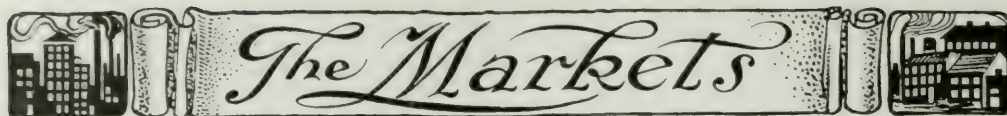
1050. **Wood Pulp.**—A Hayfield firm inquires for sulphite wood pulp. They use about 100 tons per month. The same firm is also open to purchase mechanical wood pulp. Samples on file at Department of Trade and Commerce, Ottawa.

1059. **Wood Pulp.**—A Glossop firm would like to hear from exporters of spruce wood for paper-making purposes or sulphite pulp.

1060. **News Print.**—A Cape Town commission house with connections throughout South Africa requests immediate correspondence with a view of selling Canadian news print.

1061. **Wrapping Paper.**—A Cape Town commission house is prepared to take up a selling agency of Canadian-made wrapping paper, immediate correspondence requested.

1073. **Wood Pulp Manufacturers.**—Inquiry is made by an Italian correspondent for names of Canadian wood pulp manufacturers.



The Markets

CANADIAN MARKETS

The condition of the market in pulp and paper remains much the same as it has been for the past few weeks. There is a good demand for news print and all the mills are well employed. As the end of the year approaches there is considerable speculation regarding what prices publishers who have to renew contracts will have to pay. It is predicted that the raise will be at least ten per cent. There is not a mill which has not now all the local and foreign business that it can comfortably take care of. Book plants are fairly well employed, but the majority of them are running only five days a week. The business in other lines of paper is fair, and one commodity, which has taken a jump in price and meeting with ready requisition in Canada is kraft paper.

Several mills are troubled with low water which, owing to the absence of any heavy fall rains, is getting quite serious in Ontario, Quebec and the lower provinces. Ground wood is in steady demand and all the mills are pretty well sold up.

Speaking of the market for mechanical pulp, a leading eastern manufacturer this week said that while perhaps the number of inquiries are not as insistent as they were, still his firm were receiving communications continually for quotations and particulars regarding shipments. During the past year or two market prices of pulp have not been normal, and no doubt this had been caused in Canada by over-production, due to the construction of new mills and the over-doing of the business. With the increased consumption of news the present production of pulp should be readily consumed and future prices should be, at least, normal. It has always been said that in times of war the prices of pulp advanced, and it was probable that, as the conflict continues, the figure for ground wood and sulphate pulp would go up. The east has been troubled with low water and, as a matter of record, the water in most districts had been the lowest during 1914, for many years past, and even yet there was no indication of the usual fall rains.

Many of the lumber and pulp wood companies are going to send more men to the woods than they at first thought of doing, and the north is looking for great activity. Printing houses are getting busier, although some are still on short time. Big departmental stores and mail order concerns are sending out their usual number of catalogues, while a large number of others are issuing literature booming the "Made-in-Canada" programme.

It has been pointed out that Canadian pulp manufacturers have an opportunity to develop business with Japan as that country imported last year nearly two million dollars worth of pulp from Germany and Sweden. The supply obtained from the former country has of course, been shut off, while the latter has been greatly curtailed. It is scarcely possible, however, that Canadian firms will make an effort to ship to Japan owing to the great distance, the heavy war risks and the increased freight charges, as all the surplus of Canadian mills will be taken care of in the United States and Great Britain. The demand for sulphate

pulp is normal, and prices are being made where contracts have expired on a monthly arrangement.

Jobbing houses are doing a good business, and report that the volume for October will be equal to that of the corresponding month of last year, although collections are rather slow. Rag and paper is quiet in most lines. A fine demand prevails for hard and soft shavings, but, in mixed papers and kindred lines, there is a lull. The prices, which ascended just after the war, have fallen. Generally speaking, there is a disposition on the part of all paper users to order only as required and let the producers carry the stock. Jobbing firms have also much less stock on hand than at this time last year, and are not disposed to load up for the future, but to proceed cautiously.

Quotations, f.o.b. Toronto, are:—

Paper.

News rolls, \$2.00 to \$2.10 at mill, in carload lots.
News sheets, \$2.10 to \$2.25 at mill, in carload lots.
News sheet, \$2.25 to \$2.75, depending on quantity.
Book papers (carload), No. 3, 3.75c. to 4.25c.
Book papers (ton lots), No. 3, 4c. to 5.50c.
Book papers (carload), No. 2, 4.25c.
Book papers (ton lots), No. 2, 4.50c. to 5.25c.
Book papers (carload), \$4.75 to \$5.25.
Book papers (ton lots), No. 1, 5.25c. to 6.00c.
Writings, 4½c. up.
Sulphite bond, 6½c. to 7½c.
Grey Browns, \$2.35 to \$2.75.
Fibre, \$3.35 to \$4.00.
Manila, B., \$2.85 to \$3.25.
Manila, No. 2, \$3.10 to \$3.50.
Manila, No. 1, \$3.35 to \$4.00.
Un glazed Kraft, \$3.90 to \$4.75.
Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood pulp at mill, \$16.50 to \$18.00.
Ground wood, \$22 to \$25 delivered.
Sulphite unbleached, \$16 to \$18, delivered in Canada.
Sulphite unbleached, \$18 to \$20, delivered in United States.
Sulphite bleached, \$58 to \$60.
Sulphite bleached, \$60 up, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.97½, each, Toronto.
No. 1 soft white shavings, \$1.90.
No. 1 mixed shavings, 55c.
White blanks, \$1.02½ to \$1.05.
Heavy ledger stock, \$1.50.
Ordinary ledger stock, \$1.15.
No. 2 book stock, 50c.
No. 1 book stock, 90c.
No. 1 Manila envelope cuttings, \$1.20.
No. 1 print Manillas, 60c.
Folded news, 45c to 47½c.
Over issues, 55c.
No. 1 clean mixed paper, 35c.
Old white cotton, \$2.50 to \$2.75.
No. 1 white shirt cuttings, \$6.25.

Black overall cuttings, \$1.75.
 Thirds, blues, \$1.60.
 Black linings, \$1.75.
 New light flannelettes, \$5.25.
 Ordinary satinets, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manila rope, 3½¢.
 No. 1 burlap bagging, \$1.00 to \$1.05.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5½¢ to 6¢ per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5¢ to 7½¢.
 Sulphite Bond, 6½¢ to 8½¢.
 Writing Manila 5¢.
 Colored Posters 4¢ to 5¢ per lb.
 Cover Paper 5½¢ to 7¢.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 B. Manila, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manila, car lots, \$3.10; 5 tons, \$3.20; 2 tons, \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manila, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$8.15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

Special to Pulp and Paper Magazine.

New York, October 25, 1914.

Inquiries for ground wood pulp flooded the local market during the interval with definite reports from paper mills, indicating that they were running very close to raw material supplies and were much in need of pulp. Manufacturers were not inclined to take advantage of the mills under the present conditions, as they were satisfied with a fair profit. There was some resentment of a market quotation of \$17.50 to \$18.00

f.o.b. ground wood mill for No. 1 pulp. Some grinders said they were unable to get more than \$12 to \$13 for their pulp. It was said that some pulp had been sold at \$12.50 f.o.b. ground wood mill. The conditions of the sale were such as to allow the purchaser to deduct for all pulp unfit for his use. This particular lot was a large pile of hemlock pulp that was made two years ago, and was not in any sense a number 1.

The sulphite situation reflected a quiet tone with some easing in prices on the arrival of large quantities for contract shipment from Sweden and Norway. The opinion prevailed that shipments of sulphite fibres would reach normal if continued over a couple of weeks at the present rate. Sulphate and kraft were in quiet demand and values rather weak.

The foreign rags market maintained a firm tone. Arrivals were spasmodic, most shipments coming from England. Advances received by certain importers indicated that German collections are very small and new packings are almost nothing.

Old waste papers have shown considerable easing under a large falling off in demand. Hard white shavings dropped about \$2.00 a ton, now being quoted at \$2.50 as against \$2.60 a few weeks ago. As some of the largest consumers of mixed papers went out of the purchasing market, stocks in warehouses quickly accumulated, and prices fell off under keen selling competition. Mixed papers are now held at 30¢ to 35¢ a hundredweight.

Pulp.

Ground Wood, No. 1, \$20 to \$24, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2½¢ to 2½¢ delivered.
 Unbleached Sulphite, impt., 2.05 to 2.25, ex dock New York.
 Bleached Sulphite, domestic, 3.35¢ delivered.
 Bleached Sulphite, impt., 2.85 to 3.25, ex dock, New York.
 Easy Bleaching, impt., 2.30 to 2.45 ex dock, New York.
 Unbleached sulphate, impt., 2.05 to 2.15, ex dock New York.
 Bleached sulphate, impt., 2.80¢ to 3.00¢, ex dock, New York.
 Kraft Pulp, 2.00 to 2.15 ex dock, New York.

Paper.

The general situation in American industry is reported by authoritative concerns on about a 70 per cent basis. In the paper manufacturing field a much healthier tone prevails. Reports from reliable sources show that newsprint has been operating about 85 per cent of normal. Book about 91 per cent; wrapping about 90; writing about 70; board about 70; and tissue about 90. A general average shows that paper mills have been running on about an 87 per cent of normal basis. Much speculation is offered as to the general causes of business quietness. There has been some tendency to curtail production in order to reduce mill and warehouse stocks. A canvass of jobbers showed that stocks are fairly normal, but small orders are gradually reducing these. A large part of the jobbing trade in this city is inclined to let the stocks run down rather than uphold a normal supply. Reports from the jobbing trade showed that the houses maintaining normal stocks were doing the biggest business as they were able to take care of the requests for immediate deliveries that are made by consumers. Business generally is spasmodic. The newsprint situation remained essentially unchanged. Contract consumption was fairly normal. Prices on renewals were quot-

ed at 2c to 2.10c f.o.b. paper mill. Side runs are rather scarce and prices are firm. Wrappings were in quiet demand during the interval, but values were firmly maintained. Boards reflected a slow but healthy tone. Writings were chiefly in demand in the cheaper grades. Prices are well maintained. Tissue mills reported a rather quiet period as jobbers are holding off from the high prices now asked by manufacturers.

Quotations.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13¹/₂c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4¹/₂c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manila jute, 5¹/₂c to 5¹/₂c, delivered.
 Manila, wood, 2.75 to 3.25, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$30 per ton, delivered.
 Boxboards, straw, \$28 per ton, delivered.
 Wood pulp board, \$42.50 per ton, delivered.
 Tissue, white, cylinder, 47¹/₂ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

ABITIBI COMPANY MAKING PROGRESS

The Toronto Globe publishes an interesting report as to the progress being made by the Abitibi Pulp and Paper Company. It says that 1,000 men are employed and it is shipping 160 tons of pulp daily to most of the large paper makers in the United States and Canada. Two years ago the Falls here roared in a wilderness, to-day there is one of the largest industrial concerns in the Dominion of Canada in full operation. The Abitibi Pulp and Paper Company commenced to ship pulp at the end of July and has maintained a steady production ever since. The feverish demand for newsprint as a direct result of the public's demands for special editions has sent up the price two dollars a ton, and the paper makers are bidding for the consignments from the Northern Ontario mill. From the million-acre grant of the company four to five hundred men are now cutting pulp and floating it down the main rivers tributary to the Abitibi.

The timber limit is of immense extent. It runs from within a few miles of the main line of the Timiskaming and Northern Ontario Railway to the Quebec boundary, embracing nearly all of the Abitibi Lake; to the south it reaches almost to the town of Matheson, and to the north stretches far above the east and west line of the Transcontinental Railway, running

through the wilderness. Moreover, most of the pulp cut can be floated down tributary rivers and streams into the Abitibi and right up to the mill dam. The dam has been completed, and the company is now waiting until some bridges have been raised along the Timiskaming and Northern Ontario Railway before it raises the water another six and a half feet, thereby drowning out great stretches of low-lying land. This six and a half feet extra head will give the company the power necessary in order to run more grinders and raise the capacity of the plant from 160 tons of dry pulp a day to 180 or 200 tons. The tremendous consumption of spruce can be estimated when it is stated that at the present rate of consumption 60,000 cords are being used a year, and when the paper mill is running 90,000 cords. Of the finished product 230 tons will be made and shipped every day, no pulp then being made.

Allowing for all mischances, the woods of Northern Ontario should be producing paper made right in the heart of the forest in nine months. Such good progress has been made that it can now be estimated with some safety that the plant will be finished in May next. Already the company is employing a larger force of men than any other concern of any kind in Northern Ontario, apart from the Canadian Copper Company. Seven hundred men are engaged in the pulp mill and in construction on the paper mill, and there will be a permanent staff of seven hundred at least, besides the men in the woods. Foundations are being laid for a town of three thousand people.

The company is going to lay the sewers and water mains before the frost seals the ground, and a Bay City real estate agent has sold all the inside lots he had to offer in the coming settlement near the railway track. The land is excellent for agricultural purposes, and almost every farm in the vicinity is being tilled, it being very obvious that the market for all produce at the Falls will be excellent. A market for pulpwood is also provided but the company itself can cut so cheaply that unless the settler is fortunate enough to be on a stream he can hardly fell it, haul it and pay the freight at the price offered by the company. Moreover the demand for pulpwood this year is so keen that the settler will probably be disposed to market it elsewhere.

MAINE ACTIVE.

Bangor, Me., October 28.—The outlook for the news print mills in the State of Maine at the present time is the brightest, and they are reaping a harvest from the increased demand for newspapers brought about by the great European conflict. The great mills of the Great Northern Paper Company at Millinocket, East Millinocket, and Madison and the mills of the other companies manufacturing news print are working at capacity to keep up with the orders.

The elimination of much of the competition from the News Brunswick mills, which are now selling their product across the water, has helped the situation here. The increased business brought about by the present situation will not stop with the close of the war, in the opinion of the Maine paper makers, who believe that Canada will continue to sell to the English market in larger quantities than heretofore.

There is every evidence of increased activity in the pulp and paper industry in Maine at present. Prices are strong and demand is good, two features that ought to make the coming year a prosperous one.

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No. 22

THRIFT.

The two main advantages to Canada that are spoken of as coming from the present conflict are that Canada will be able to replace German products with her own and that there will be a tendency back to a solid basis in finance and industry instead of wild speculation, inflation and extravagance.

The former advantage is now being discovered to a small extent. One commodity which has already displaced the German article in many markets is kraft, and it is not seriously doubted that the prosperity of Canadian manufacturers will be maintained and increased after the close of the war.

The other advantage is simply—economy. All Canadian financiers agree that the country has been borrowing too heavily and spending too freely. With the money which has been forthcoming from the mining of fertility from Western wheat fields, the bonding of questionable enterprises and the sale of real estate in the most impossible situations, Canadians have made merry. Now, say the financiers, it will be necessary for us to sober down to the stern business of paying up for our prodigality. The proceeds of wheat, cheese, minerals and manufactures which we promised to send the peasants of France, the farmers of England and others who trusted us with their hard-earned savings (through British and French capitalists) must be sent to their purchasers. Our notes which were to fall due in the bright, rosy and indefinite future are now held for payment in the immediate present. We must economize, we must encourage thrift and production in every way.

Europe lends us money largely because the people are thrifty. Millions of dollars every year come from the wool stocking and chimney corner of the careful,

saving peasant and middle class. Undisturbed by unnatural ideas of expenditures and extravagance they save money penny upon penny, pound upon pound.

We need such a spirit in Canada. Too much stress cannot be laid upon saving. A wealthy Montrealer who died recently provides an excellent example leaving the great part of his money invested in such a way that the interest should be distributed as small bank accounts to boys and girls in the schools, the object being to inculcate the saving habit.

Thrift is the watchword of the day.

In this connection it is interesting and instructive to regard an agency for thrift which has had great success in the Province of Quebec, where there is legislation favorable to it. This agency is the system of co-operative people's banks, a comparatively new venture in Canadian soil but one filled with promise for the future.

As a means of conducing to prosperity in pulp mill centres the value of "la Caisse Populaire" or People's Bank can hardly be overstated. It is well known that one of the main disadvantages which any pulp or paper enterprise in this country has to face is the difficulty of holding good men in the small towns or settlements in which, on account of the distance of wood and power from densely populated centres, these mills must be established. The co-operative bank, maintained in the proper spirit, is conducive to prosperity and contentment.

To Mr. Alphonse Desjardins, of Levis, Quebec, must be given the credit for the inauguration of such a system in this country. After many years of study of national characteristics and various systems of co-operative banking he evolved the type which is acknowledged by leading banking authorities as the one most likely to succeed on the American Continent.

Honesty is the corner stone of this banking structure. A man does not need money to hold his head up among his fellows in the co-operative bank. As long as he can maintain the confidence of his fellow members for his honesty, sobriety and industry, he can borrow money from the mutual institution.

Mr. Desjardins says: "A co-operative people's bank is not an ordinary financial concern, seeking to enrich its members at the expense of the general public. Neither it is a loan company seeking to make profit at the expense of unfortunates who need loans, laboring men suffering from unemployment, agriculturists suffering from drought or floods—a company having no mercy for its victims and not hesitating to impoverish them to the extreme limit. The people's bank is nothing of the kind; it is the expression in the field of economics of a true Christian spirit and high social ideal. It is based upon the high conception, wholly just, equitable and fruitful, of "union for life" instead of "struggle for life." It does not look for big profits, although the future may have in store surprises of a very agreeable character, as has happened in Europe, where, thanks to the wise measures taken at the start, yearly dividends reach to-day proportions that no one would have dreamed of when these banks were organized.

It is open to all, provided that each is honest, industrious, sober and lives up scrupulously to his engagements. Money alone cannot entitle one to become a member. Dollars count only after honesty; they cannot replace this quality. In the joint stock company honesty is never thought of as necessary to membership because such a company is a mere aggregation of funds."

A man who is a depositor to-day, earning three per cent on his savings may be a borrower tomorrow at five per cent, and vice versa. It has been found that only small loans are asked for and that the profits of the bank as time goes on are very satisfactory, running to five per cent.

The outstanding example of the success of the bank is seen in Lévis, Quebec, where in fourteen years, from an initial payment of a dime and a collection among the founders of twenty-six dollars, the assets of the bank have grown to well over \$300,000 and the loans which had been made amounted to about a million and a half. And this is among a small company of friends, just such as could be found in any paper-making centre. In Chicoutimi, Quebec, there is, indeed, a people's bank of which the secretary of the Chicoutimi Pulp Company is the manager. The members of the bank are practically all employees of the pulp company.

Honesty, sobriety, industry, thrift and prosperity are all advanced by such a bank. Pulp concerns can well afford to foster such organizations in their manufacturing centres.

IMPROVEMENT IN INDUSTRIES.

The manufacturers of Canada as well as of the United States will be greatly encouraged by the report recently issued by Duns. According to this agency "basic conditions are improving." War orders are undoubtedly flowing steadily into this continent, serving as a stimulus to every branch of industry. The recent visit to Washington of Sir George Paish, the eminent British financial authority, which resulted in greatly eased relations between British and American financial houses will do much to make business run along in the same smooth way. The cotton trouble of the South has been greatly eased by the efforts of the cotton associations in their "Buy - a - Bale" movement. The steel industry is beginning to pick up. Little, lumber shows a slight improvement, textile are busy and leather manufacturers are receiving great impetus. Meat, horses, arms are all in demand.

All these conditions hold in Canada as well, but the fact alone that the United States promises to have a greater degree of prosperity is sufficient to give Canadian pulp and paper men much heart. Pulp is certain to be in greater demand, and with the resuming of advertising, news and book paper should see marked improvement. The same applies to the other lines, to whom the Christmas boom will mean considerable.

EDITORIAL COMMENT.

The recent Republican successes at the polls in the United States has caused some degree of satisfaction among papermakers across the line. It is felt that this is evidence of a public sentiment which will tend to sweep away the Underwood Tariff Schedule though in some quarters to have worked hardship to the industry.

The forces of newspaperdom have of course still to be taken into consideration. This present election was and still more to the speculation which was being indulged in by all America as to the tendency of United States political life and legislation.

The Forestry Branch of the Department of the Interior will shortly have ready for distribution copies of the bulletin on Pulpwood Consumption in Canada in 1913. The information is of considerable value in showing the consumption of the various species of wood and the prices which are paid for raw material. The bulletin is only one of forty-six publications which have been issued since 1907. These deal with forest conditions in various parts of the country as surveyed by the Forestry Branch foresters, and with the forest products of the Dominion, such as timber, poles and ties, cooperage, etc. They afford, indeed, an excellent bird's-eye view of our forests and the industries springing from them.

This is one of the laudable ways in which the Dominion Government is using its centralized powers to the

immense advantage of the country. These bulletins are of the highest value to those connected with forest industries, and can be read with great profit even by the layman. In these days when Canada is asserting herself as one of the powers in forest products, knowledge of the wealth and nature of the industries are more largely demanded and the efforts of the Forestry Branch are being widely appreciated. All publications are free and may be had on application.

Another effort in compilation which is a wonderful tribute to the efficiency of the recently-created Bureau of Statistics of the Quebec Government is the first annual number of the Statistical Year-Book of the Province. In it are brought together all the leading facts published by other agencies, such as the Federal Government, with the addition of a great mass of data for the first time compiled. Nothing of importance from Cabot's discoveries in 1498 to the num-

ber of beehives at present in the province has been omitted. Maps and diagrams of the very highest class add to the attractiveness of the volume of four hundred and fifty pages.

Of especial interest and value is the section dealing with the Province's wealth, written by Mr. G. C. Piche, Chief of the Quebec Forest Service and his assistant, Mr. A. Bedard. A more comprehensive study could hardly be made. Much credit is due to Mr. Piche and to the statistical bureau for their clever work.

A new system of digesting with the object in view of securing by-products such as tannic and acetic acid is described in this issue. If the inventor can operate such a plant on a commercial basis he will have taken a great step forward in the intensive utilization of wood. The point in his system that the wood itself is made to provide the disintegrating medium is most interesting. The success of this system will be viewed with close attention by the industry.

NOTES ON THE EFFICIENCY OF BEATERS

By LEO SCHLICK, M. E.

(Written Specially for Pulp and Paper Magazine.)

Mechanical pulp, chemical fibre and rags during the past century have been reduced in beaters whilst in earlier times stamps were generally employed for the purpose. The Beating Engine has been originated in Holland which led to the distinction of the "Holland Beater," with which the open tub type is characterized.

The very first machines had small solid rolls of sandstone. The tubs were also built of sandstone, or occasionally of wood, whilst the bedplate was formed by corrugated or grooved iron plates or grooved stone slabs.

Later on when the Beating Engine was introduced in the olden times paper mills, replacing the historic stamps, the rolls were made of a solid oak block, fitted with steel or bronze flybars. The size of the rolls was still small and the weight of the roll was allowed to rest fully upon the bedplate during the beating. The paper-maker then accustomed to the work with the stamps, was quite willing to wait until the rags were reduced to the pulp wanted, the weight of the roll and the actual beating surface determining the specific pressure and with same the reducing effect upon the fibre bundles.

At those times, a strong grade of paper was made regardless of time and samples, still prove that age did not do a great deal of harm to its strength.

As competition grew keener, the weight of the rolls was increased, hereby increasing the reducing effect of the beating surface, this being beneficial to the mill owners pocket but not to the entire benefit of the quality of the paper. Soon the diameter of the rolls became too large to be made from oak and therefore,

cast iron was used for the manufacture of the body, particularly for the manufacture of papers made of chemical pulp.

The method of working with the full weight of the beater roll on the bedplate, was abandoned. It was found that rolls of large diameter propelled the pulp better within the tub, and in order to make up for too heavy a roll, both bearings of the latter were placed on levers, which could be raised or lowered by means of spindles and handwheels, allowing to adjust a space between bedplate bars and flybars, just sufficient to catch the fibre bundles, and the thick fibres, whilst the fibres smaller than the adjusted space passed untreated through the beating surface. In order, to obtain a stronger paper from the same material, in recent years, counterpoising devices for the rolls have been employed with greatest success. The roll rests here fully upon the beating surface whilst the counterpoising device compensates, according to requirements, the excessive weight of the roll.

We have therefore, to make the distinction between beaters, working with an adjusted space between flybars and bedplate bars and those working with a counterpoised roll.

It is a well-known fact and is endorsed by every practical paper-maker, that a small engine gives a stronger pulp than a big one, which emphasizes my theory the more, as here the difference between actual weight of the roll wanted (to get the beating effect) and the weight of the roll, dimensioned by the manufacturer to stand the work) is smaller on small beaters than on larger engines: that is to say, smaller on rolls of small diameter than on rolls of large diameter. The diameter of the roll depends, as a rule, upon the capacity of the tub, as in the "Holland Beating Engines," the shaft ought to clear the level of the pulp.

Several years ago the writer designed a set of engines for a mill manufacturing bank note paper, and a guar-

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antee had to be given as regards actual beating surface and the respective specific pressure upon same. These rolls rested fully upon the bedplate and the pulp was beaten in the old style fashion until it actually was reduced to the pulp wanted. The proper proportioning of the actual beating surface is here of course of utmost importance. I will describe later on how the beating effect of engines should be calculated. It is evident that the expensive chemical fibres should be carefully fibrillized and be carefully split and not crushed, as done only too often.

As far as power consumption of an engine is concerned, clear distinction has to be made between unproductive power to be spent, for the circulation of the pulp in the tub and productive or absolute power spent for beating only. The unproductive power has:

(1) To overcome the friction of the pulp on the walls of the tub.

(2) To overcome the friction in the bearings.

(3) To overcome the friction of the flybars on the pulp.

(4) To accelerate the pulp from its velocity in the tub to the circumferential velocity of the roll.

For overcoming the friction of the pulp in the tub, generally a reasonable assumption must be made for, as proper tests in these respects have so far not found consideration in the design of Beating Engines although co-efficients of friction have been found for various mixtures of pulp on steel, wood and cast iron. As a rule, a certain additional incline of the bottom of the tub takes care of this, this being generally left to the discretion of the experienced beating engine designer.

The power consumed by the friction in the bearings can easily be determined and same refers to the friction between flybars and pulp, whilst the power consumed to speed up the pulp from the velocity in the tub to the circumferential velocity of the roll depends upon the velocity of the pulp in the tub, width of the roll and the circumferential velocity of the roll. Here a considerable amount may be wasted if the rolls revolve too fast, thus disabling the pulp from entering the spaces between the flybars freely. If, therefore, the capacity of an engine is to be increased it is more advisable to increase the number of bedplate bars than to speed up the roll; thus, the beating effect is increased without decreasing the pulp circulation.

The power spent for the productive work, that is to say, for the beating of the pulp, depends entirely upon the co-efficient of friction between steel and fibre, lava and fibre or bronze and fibre; whatever material the pulp maker sees fit for reducing a given quality of pulp.

It may be stated that now-a-days, the cooking of chemical pulp is enormously developed and in manufacturing a certain class of paper as a specialty, the paper maker can purchase the particular kind of pulp most suitable for his purpose. Thus for instance, a paper maker working up a hard Mitscherlich pulp will be compelled to use stone rolls for the manufacture of grease-proof whilst when specializing in grease-proof this grade can easily be manufactured from special grease-proof grade Mitscherlich and be beaten within two to two and a half hours with bronze bars in ordinary engines. I have done this myself.

For this reason large paper mills contracting for the supply of a special grade chemical pulp will beat out the smaller manufacturer, as far as profits are concerned as the latter's needs would not warrant to cook profitably

So for instance, Scandinavian grease-proof make contract for a special grade of Mitscherlich, mixers and finish in especially strong and especially built Jordan Engines, being fitted with elastic pressure controlling device, and coupled to electric motor. It must, however, be understood that the Jordan Engine can never displace the beating engine, this being due to the absence of flexible beating and thorough continuous mixing. The beating surface a Jordan is a limited one to a certain extent. A pulp is bound to pass the beating surface within a certain limit of time, which of course, can be extended in using a sufficient number of Jordans.

The pulp in a modern high speed beating engine, however, can be beaten individually and the quality of same can be controlled during the beating process whilst this is not possible in a Jordan. As a rule the pulp passing into a Jordan is already loaded and sized. What I mean is, the china clay and rosin already deposited upon the fibres before same are to be reduced to the proper size. Thus, the depositing and loading materials have to be transferred from a thick fibre to the thin fibres during the beating, this not being to the benefit of the paper. For this reason, special mixers have been installed in paper mills which of course, mean a complication which easily could have been helped in using modern high speed beating engines.

A beating engine is to be considered as combination of a reducing apparatus and a mixer. It is evident that the circulation of the pulp in the tub has no other effect than to mix the pulp properly, whilst the reducing apparatus should be as efficient as possible. This means an engine should circulate the pulp under high speed, thus eliminating the settling lumps on the sweeps and the bottom and should have an amply dimensioned roll of a large efficiency as propeller and a beating surface of maximum possible capacity.

In order to obtain the maximum possible efficiency of a roll, the pulp should reach it with a velocity as large as possible, in order to be pressed into the spaces between the flybars. Therefore, the faster the velocity of the pulp in the tub, the less power needed to accelerate the pulp to the circumferential velocity of the roll. This is easily to be understood assuming for the sake of explanation the pulp entering the spaces between the flybars to have the same velocity as the circumference of the roll, which, of course, cannot be done in practice. Hereby no power would be required to accelerate the pulp. It therefore, cannot be sufficiently emphasized how important it is to obtain a maximum possible speed in the tub and the writer in various cases have clearly shown savings of up to 40 per cent of the power in a beating engine in reference to the previous output. The speed in the tub only can be obtained in converting into speed the kinetic energy, imparted to the pulp by the propelling roll. For this purpose we have to employ the hydraulic laws.

In any case, be it an inefficient beater or an efficient one, a certain amount of power has to be spent to accelerate the pulp from the velocity of the tub to the circumferential velocity of the roll. All that we have to do is to convert this kinetic energy into speed. The pulp pumped up over the backfall is the beating of a very large amount of bound energy. If one, for instance, opens the hood over the backfall, one can notice the effect of the enormous additional kinetic energy. The latter set free, splashes the pulp high up in the air. A proper guide, a diffusion valve

only can direct the flow of the pulp and convert the useless pressure in useful speed. Here no firm rules can be given, this being left to the discretion of the experienced engine designer, who on hand of careful studies dimensions these parts accordingly.

As regards actual beating surface and its power consumption, it is to be noted that the latter depends entirely upon the specific pressure and the fibrillizing effects of the bars which I call the cutting lengths and which I will define more clearly hereafter.

As a rule, the flybars on an engine should be set in an incline to the axis of the roll, as Figure 1 shows, hereby propelling the pulp from the inside to the outside, and to facilitate the pulp to enter the spaces between the flybars.

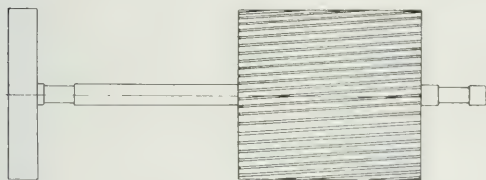


FIG. 1

In this case, the bedplate bars are placed in parallel to the axis of the roll. This design also allows the air to escape easily from the spaces between the flybars. Very often, however, the flybars are in parallel with the axis of the roll, and the bedplate bars are set in an incline. In other cases, where a more rigorous reducing or mixing is wanted, both are done.

Calculation of the Actual Beating Surface.

If A represents the angle between two crossing bars, a the area of one crossing in square inches, Tf

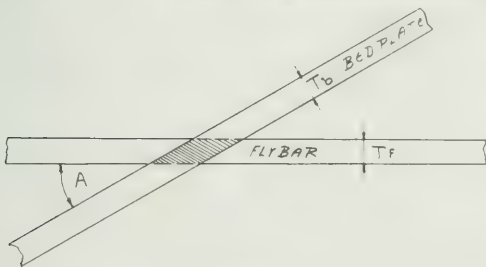


FIG. 2

the thickness of the flyer in decimals of an inch and Tb the thickness of a bedplate bar in decimals of an inch,

$$a = \frac{Tb \times Tf}{\sin. A}$$

The beating surface is composed of a certain number of crossings of bars.

Pr = Pitch of flybars in decimals of an inch.

Nr = Number of flybars.

Tf = Thickness of flybars in decimals of an inch.

N = Number of bedplate bars.

Tb = Thickness of bedplate bars in decimals.

A = Angle between crossing bars.

Ab = Angle between bedplate and axis.

Ar = Angle between flyerbar and axis.

W = Width of the roll in inches.

Bs = Actual beating surface.

$$BS = Nb \times Tb \times W \times \frac{Tf}{Pr \times \cos A} \text{ in sq. ins.}$$

for bed plates in parallel, with the axis and flyerbars inclined to same.

If the flyerbars are in parallel with the axis of the roll the actual beating surface is

$$BS = \frac{Nb \times Tb}{\cos A} \times W \times \frac{Tf}{Pr} \text{ in sq. ins.}$$

If both flyerbars and bedplates are inclined, the actual beating surface is found in using the formula

$$BS = \frac{Nb \times Tb}{\cos Ab} \times \frac{Nr \times Tf}{\cos Ar} \times \frac{W}{\text{dia.} \times \Pi}$$

A fair approximate result is obtained in using the formula

$$BS = Nr \times Tf \times Nb \times Tb \times \frac{W}{\text{dia.} \times \Pi}$$

EXAMPLE:

Roll dia. = 72 ins.

Width = 60 ins.

Number of flyerbars = 87

Thickness of flyerbars = 0.375 ins.

Complete weight of roll plus shaft = 16,000 lbs.

Angle between axis of roll and bedplates Ar = 4 deg.

$$\text{Flybar pitch } Pr = \frac{72 \times 3.14}{87} = 2.6 \text{ ins.}$$

Number of bedplate bars Nb = 40

Thickness of bedplate bars Tb = 0.25 ins.

Flybars bars to be in parallel with the axis of the rolls, and bedplates to be inclined.

$$BS = \frac{Nb \times Tb}{\cos A} \times W \times \frac{Tf}{Pr}$$

$$= \frac{40 \times 0.25}{1} \times 60 \times \frac{0.375}{2.6}$$

$$= 10 \times 60 \times 0.144$$

$$= 86.4 \text{ square inches.}$$

The maximum possible specific pressure upon the actual beating surface is then—

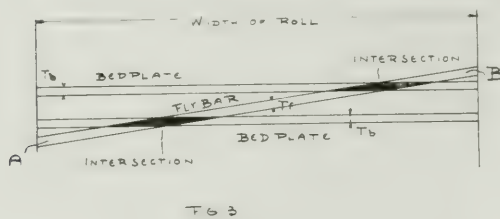
$$\text{Weight of roll } \frac{16000}{BS} = \frac{16000}{86.4} = 185 \text{ lbs sq. in. specific pressure}$$

The proportioning of actual beating surface influences the capacity of the engine considerably, whilst the specific pressure upon the beating surface is based upon experience.

Several years ago the writer investigated a beater plant where the completely new and generally well built engines needed fully 6½ hours to reduce Mitscherlich to writing pulp. A careful investigation showed a wrongly proportioned beating surface, after chagement of which a high grade stock was beaten within 2½ hours.

Cutting Length.

When a roll fitted with flybars being parallel to the axis is revolving, every one of its flybars will come in touch with every one of the bedplate bars and in the above fig. No. 3 mentioned "Intersection" will



move from right to left (see Fig. No. 3): that is from B to A. I call the distance travelled by this intersection the "cutting length."

The cutting lengths of a beating engine are to be figured as per the formula—

$$L = Nb \cdot W \cdot Nr \frac{\text{R.P.M.}}{60} \text{ in ins. per sec.}$$

The cutting lengths of the above example would be—

$$L = 40 \cdot 60 \cdot 87 \cdot \frac{90}{60} = 313,200 \text{ inches per second.}$$

Supposing the tub of the engine has a capacity of 1800 lbs. at 7 per cent dry, then the cutting lengths per 100 lbs. of pulp at a basis of 7 per cent dry would be—

$$L = \frac{313,200}{18} = 17,400 \text{ inches per second.}$$

The larger the cutting lengths in an engine, the larger the beating capacity, the shorter the beating time. As a rule, the paper manufacturer will make papers of similar character on a certain machine, and he should use engines having sufficiently heavy rolls to allow for a maximum possible dimensioning of the bedplate.

The thickness of the bars has to be taken in accordance with the quality of the pulp to be beaten; thus a thin flybar having cutting edges of $\frac{1}{4}$ in. to $\frac{5}{16}$ in. will beat free pulp if working under an economic specific pressure, bars of $\frac{5}{16}$ in. to $\frac{3}{8}$ in. thickness will be good for the average requirements, whilst a still thicker flybar gives a more surety pulp, all the above subject to a proper specific pressure.

Owing to the getting blunt, that is to say round of the edges of the steel bars, the same specific pressure cannot be maintained all the time; thus two engines of the same make differ somewhat as regards capacity when comparing the same phases of the beating.

Generally the beater man hears how the engine is beating and a glance at the surface of the pulp is sufficient to tell him how far the beating has proceeded. He can control the time in which the pulp is to be beaten, but not the actual specific pressure upon the beating surface. This led to devise the counterpoising of the roll. In engines equipped with this device the rolls are strong and heavy whilst a plate weight and lever system allows the beater man to control exactly the pressure upon the beating surface, on

which the reduced weight of the roll is resting.

If charging such engines with pulp the rolls will jump up a little only and then not damage anything as the roll and the counterpoising device absorb a considerable amount of shock owing to their masses. We have a similar example in motor cars. A heavy car will go smoothly over a road where a light car will jerk.

Productive Power Consumption.

This refers to the actual beating only.

$$\text{H.P.} = \frac{BS \times Q \times U \times V}{550}$$

BS = Actual beating surface in square inches.

Q = Pressure per square inch upon actual beating surface (specific pressure).

U = Co-efficient of friction.

V = circumferential velocity of roll in feet per second.

EXAMPLE:

Roll dia. 72 ins.

Roll width, 60 ins.

Roll weight 16000 lbs., including pulley, shaft and proportion of weight of the levers on which bearings are mounted.

BS = 86.4 square inches.

Q = 110 lbs. per square inch active spec. pressure.

U = 0.065.

V = 28 feet per second.

The power consumption of the engine figures then as follows:—

$$\frac{86.4 \times 110 \times 0.065 \times 28}{550} = 31.6$$

That is to say, the beating engine consumes 31.6 brake horse-power on the beating surface not figuring the acceleration, bearing friction and flybar friction.

Power Consumption for Accelerating the Pulp.

This forms a very important item. The power consumption here is:—

$$\text{H.P.} = \frac{M \cdot V \cdot V_p \times V}{32 \cdot 550}$$

M = lbs. of pulp to be accelerated per second.

V = Circumferential velocity of the roll in feet per second.

Vp = Velocity of the pulp in the tub in feet per second.

EXAMPLE A.

The average velocity of the pulp in the tub is found to be 50 feet per minute. The area of a cross section of the flowing pulp is measured to be 16.5 square feet. The quantity of pulp in cubic feet accelerated by the roll per second is, therefore

$$\frac{16.5 \times 50}{60} = 13.75$$

The weight of pulp to be accelerated per second is therefore, 13.75 × 50 = 687.5 lbs.

The circumferential velocity of the roll is 28 feet per second. Therefore the power consumption to accelerate the pulp—

$$\text{H.P.} = \frac{62.5 \times 687.5 \times 32 \times (28 - 0.83) \times 28}{550} = 18.5$$

which amounts to—

$$\frac{18.5}{687.5} \times 100 = 2.7 \text{ H.P. per 100 lbs. of dry pulp, circulating in the tub.}$$

EXAMPLE B.

The same engine as the above circulating the pulp with 25 feet per minute only, has a quantity of pulp to be accelerated per second of

$$\frac{17.5 \times 25}{60} = 7.3 \text{ cub. ft.}$$

equals to $7.3 \times 50 = 365$ lbs. of pulp per second and requires—

$$\text{H.P.} = \frac{62.5 \times 365 \times 32 \times (28 - 0.42) \times 28}{550} = 10$$

which amounts to—

$$\frac{10}{365} \times 100 = 2.73 \text{ brake horsepower per 100 lbs. of dry pulp circulating in the tub.}$$

whilst in both cases as evident the amount of power consumed to accelerate 100 lbs. of dry pulp is the same, in example A as much as 687.5 lbs. per second are passing the beating surface, whilst in example B as much as 365 lbs. have got the chance to be beaten only.

The beating time is, therefore, in proportion to the pulp passing over the actual beating surface: that is to say, an engine with 50 feet of pulp speed per second will have 1.87 the capacity than the engine of 25 feet of pulp speed per second.

Assuming the beating time for a certain pulp in the engine with 25 feet per minute is 2 hours, then the beating time of the engine with 50 feet circulating velocity is—

$$\frac{2}{1.87} = 1.07 \text{ hours.}$$

The proper gauge for the capacity of a beating engine is the amount of pulp turned out by one horsepower per hour.

EXAMPLE:

Beater A.—Capacity 1800 lbs., actual beating surface 86.5 square inches.

Specific working pressure 110 lbs. per sq. in.

Circumferential velocity of roll = 28 feet per second.

Pulp speed per minute, 50 feet.

Beating time, 1.07 hours.

Power consumption, 50 brake horse-power.

Charge 1800 lbs. dry.

$$\text{Capacity per hour} = \frac{1800}{1.07} = 1682 \text{ lbs. of pulp (dry)}$$

$$\text{One H.P. per hour beats } \frac{1682}{50} = 33.6 \text{ lbs.}$$

Beater B.—Capacity 1800 lbs. actual beating surface 86.5 sq. ins.

Specific working pressure 110 lbs. per sq. in.

Circumferential velocity of roll = 28 feet per second.

Pulp speed per minute 25 feet.

Beating time 2 hours.

Power consumption 41.6 B.H.P.

Charge 1800 lbs. dry.

$$\text{Capacity per hour} = \frac{1800}{2} = 900 \text{ lbs. of pulp (dry)}$$

$$\text{One H.P. per hour beats } = \frac{900}{41.6} = 21.6 \text{ lbs.}$$

This is the evidence that two beaters with the same make of rolls, frames and bedplates can give such different results and hereby the economical value of the high velocity in the tub of the beating engine is proved.

It is proved that a pulp speed of 50 feet per minute produced 1.87 times more in a given time than a pulp speed of 25 feet, not considering the advantageous mixing and the uniform stock obtained by rapid circulation.

As regards beating time, we can safely say that in a modern beater without the use of a Jordan, news pulp should take 35—50 minutes; wrapping with 25 per cent ground wood, 45 minutes. Extra strong wrapping 60—80 minutes. Pure Mitscherlich sulphite (into strong stock) 120—160 minutes. Pure Ritter Kellner sulphite 80—120 minutes, etc., etc., and here considerably better results can be obtained.

This is to be the actual beating time under consideration of rapid pulp circulation, roll counterpoising, large actual beating surface and a sufficient amount of "cutting lengths."

Following the unproductive work to be rendered we have to consider:—

Friction of Flybars on the Pulp.

$$\text{Fr} = \frac{0.25 \times 12 \times \text{Tf} \times \text{W} \times \text{V}^2}{550} \text{ in H.P.}$$

EXAMPLE:

$$\text{Tf} = 0.375 \text{ in.: pulp speed } \text{W} = 50 \text{ ft. min.} = 0.835 \text{ ft. sec.}$$

$$\text{V} = 28 \text{ ft. sec.}$$

$$\text{Fr.} = \frac{0.25 \times 12 \times 0.375 \times 60 \times 28^2}{550} = 2.7 \text{ H.P.}$$

The friction of the flybars on the pulp in tub of the beating engines as being described above is 2.7 H.P.

Friction in the Bearings.

$$\text{Fb} = \frac{\text{Pr} \times \text{U} \times \text{dia.} \times \text{II} \times \text{R.P.M.}}{60 \times 550}$$

EXAMPLE:

U = Co-efficient of friction = 0.05.

Pr = Weight of roll in lbs. including pulley = 1600

Dia. of bearing in feet = 1.75

R.P.M. = 90

$$\text{Fb} = \frac{16000 \times 0.05 \times 0.75 \times 11 \times 90}{60 \times 550}$$

5.1 H.P.

Total Power Consumed in Beating Engine as per Our Example.

Productive.	B.H.P.	Unprod'v. B.H.P.	Total
Actual beating..	31.6	Acceleration 18.5	
		Bearing friction	5.1
		Friction of flybars on pulp	2.7
	31.6	26.3	26.5
			31.6
			57.9 B.H.P.

Materials for Flybars and Bedplate.

Generally a strong steel bar of sufficient thickness gives best results. For papers made from bleached pulp, strong bronze bars of not less than 3-8 in. thickness can be used. Special care has to be taken to fasten the flybars properly. Damages are less caused on account of the bronze than on account of too weak a connection. Bronze of $\frac{1}{4}$ in. thickness will give away should a paddle pass the beating surface.

Basalt lava slabs recently have been often used. As basalt is very porous, the fibres find many cutting edges, whilst at the same time, the heavy stone slabs increase the weight of the roll.

We may mention here that the very old "Hollander" with stone rolls has been redesigned by the German paper maker Schmidt, whose rolls are now sold on this continent. For several years Helin's beating material composed of chilled porous castiron has been employed and renders good results for the manufacture of strong papers. The numerous pores in this material give the fibres opportunity to rest against and to become fibrillised.

In general, the flybars are still secured to the roll by shrinkings, the design of which has been considerably improved. Stone and cast-iron slabs are preferably cemented into a castiron body being provided with ribs for the purpose. The sides of the rolls are then covered with a heavy cement coat.

Conclusions.

Beating engines should be designed for a rapid pulp circulation. Rolls should be heavy, should be provided with amply dimensioned spaces between the flybars and should have a counterpoising device.

Beating Material.

The writer, having travelled over the American and European Continent, only can say that paper makers' opinions on this point are very much opposed. According to paper mill experience, I know that a large beating surface, a proper amount of "cutting lengths" in connection with a sufficiently heavy roll and a large velocity in the roll, are all one requires to "make" paper.

I have seen grease proof paper made with steel bars with bronze bars and with stone rolls. Some people beat news print in double beaters fitted with one stone roll and one steel roll; others, use no beater at all and say the Jordan is the only thing.

My father said, during 40 years of managing all kinds of mills, that he got the largest speed on the paper machine (700 feet per minute), with strong Mitscherlich, carefully made ground wood and with high velocity beaters with steel flybars without Jordan. For fine papers he used bronze flybars only. Another paper maker known to me uses nothing else than Horne engines. The farther you travel, the more the opinions diverge.

Indeed, the funniest beater designs have been created with screw propellers, revolving wing propellers with small rolls, with large rolls; but one could not get away that the pulp has to be mixed and to be beaten and this on a well dimensioned beating surface under a proper pressure, and that there must be sufficient edges for the pulp to lie against when it is to be drawn out and fibrillised. The flimsy designs will go and pretty soon we will see our old-fashioned Holland beater reinstated with the good old open tub which you can clean so easily, but it will look somewhat different though. It has grown in height and looks sturdier.

The Tub.

Wood, castiron, plain concrete or plated, all should be designed to avoid depositing of lumps. The beater should fulfil the demand of the machine tender. "Give me a clean and strong stock and I will run it off as fast as you want me to."

Prices are low now-a-days and it takes a lot of hard thinking how the most profit can be made on an order. Sometimes there are very small profits only. There, the only salvation is the speeding up of the paper machine, to use clean and strong stock in order to get the speed and to use sturdy, well mixing, speed beaters to get the clean and strong stock of the cheapest possible combination of raw materials. The paper is made in the beater and run off on the machine.

DRYING PAPER SHEETS.

A patent has been granted to Mr. W. E. A. Hickson of Wellington, New Zealand, for a new process as follows:—

Sheets of paper supported on an endless web of band are dried by currents of air introduced above and of hot air introduced below. Beneath the drying chamber are fixed a series of heating chambers spaced apart and communicating with the drying chamber through transverse slots. Each chamber contains a burner over which lies a baffle. A longitudinal pipe extends along the drying chamber, and is supplied with air from a blower; it is provided with valved branch pipes which direct air through apertures or nozzles on to the paper. The burner comprises an outer pipe connected with a gas main and having a burner jets along its length; air is supplied through an inner pipe connected by a branch with the main pipe which also supplies the pipe. Hinged flaps are provided at the ends of the drying chamber, and inspection doors for the chambers.

THE PRODUCTION OF PAPER FROM BAMBOO

"Paper Making." London, reports that for some time past important experiments have been conducted by Mr. James L. Jardine, of Esk Mills, Penicuik, in the manufacture of paper from bamboo. The results have proved highly successful, and the process has been patented by Mr. Jardine, in conjunction with Mr. Thomas A. Nelson, of Parkside Works, Edinburgh. Mr. Jardine has introduced a modification of the bisulphite process, and has succeeded in producing an easy-bleaching pulp from bamboo. The invention practically consists in cooking the decorticated material in a digester with a solution of magnesium or sodium bisulphite, or an acid sulphite with a surplus of available SO_2 , and completely removing from the liquid in the digester the gases liberated in the course of cooking. It is understood that paper has been manufactured on a commercial basis with the most satisfactory results.

The following particulars are given in the complete specification:—

A commercially bleachable pulp cannot be produced from bamboo or similar vegetable growths, the incrusting ingredients of which are mixtures of lignin and pectose, or substances chemically similar, by any of the bisulphite processes as employed for extraction of pulp from wood and the like lignified substances. We have discovered that this due to the excessive acidity of the liquor as used in the process of digestion, caused by the liberation and retention in the digester of the sulphurous acid gas.

In the modern day wood pulp process where the digester is internally heated, the sulphurous acid gas liberated in the heating and cooking is, as far as practicable, kept in contact with the pulp, and only quantities are allowed to escape from the digester sufficient to admit of the entrance of enough steam to secure and maintain the proper cooking temperature, this being controlled by direct thermometer readings.

If bamboo and the like be treated in a similar manner a secondary reaction occurs in the later stages of the cooking which upsets the chemical equilibrium and a brown aldehydic product is deposited on the fibres, rendering them commercially unbleachable, or if the hydrolysis is lessened to prevent the deposition of this organic reducing agent the resolution is incomplete, and although a light yellow coloured pulp can be secured it does not bleach as the fibres are still combined with or incased in encrusting ingredients.

Our invention consists in a process whereby these difficulties are overcome, our method ensuring that the lingo and pectic constituents, along with the coloring matters, and the like, are so thoroughly removed that the subsequent bleaching for the production of a white pulp does not need more of the usual bleaching agents than are required for pulps already used in the trade.

In the process forming the subject matter of the present invention, a base which yields a soluble sulphite must be selected, such as magnesium, or sodium, or their equivalents, and to it is added in any convenient manner sulphurous acid gas, as in certain known processes for the resolution of wood, but according to the invention these chemicals are so used for the produc-

tion of paper pulp from bamboo and the like that the deposition of an aldehyde is prevented, and only the proper degree of acidity is maintained to sulphonate the lignin, leaving the base free to resolve the pectic and coloring ingredients.

Magnesia does not readily dissolve in weak sulphurous acid, and thus when its solution is effected by any of the ordinary processes, the resultant liquor generally shows at least the bisulphite proportions of SO_2 . Sodium sulphite, on the other hand, is readily soluble, and we find a solution containing three-fifths or thereby of the bisulphite equivalent provides a liquor with a surplus of available SO_2 , so rendering it suitable for our process. This constitutes what might be called an acid sulphite solution.

In order that the fibrous tissues may rapidly and uniformly absorb the liquor, their colloidal adhesions must be broken down by mechanical crushing. The raw material after receiving this preliminary treatment is packed in a digester, the prepared liquor is added, and the heating and cooking is secured by the application of direct steam.

It is advisable not to fill the digester too full, as space is necessary for the free separation of the gases evolved from the liquor, and as these are liberated they must at once be removed, and for this purpose a continuously free exhaust fixed in the highest part of the digester is kept open throughout the entire cooking. The escaping steam and gas may be passed to a cooling coil or condensing apparatus for SO_2 recovery in any known manner.

So thoroughly must the gasified SO_2 be removed, that no opposing pressure is created in the digester; the cooking temperature is thus at all stages directly equivalent to the steam pressure, and no thermometer need be used.

The stage of resolution is easily determined by a test of the total sulphurous acid percentage contents of the liquor, and as the reduction of this towards the finish of the cooking is gradual, the most advantageous point of exhaustion can be secured. Throughout the digestion by the removal of the gasified SO_2 the degree of active acidity automatically regulates itself to suit the condition of the pulp and the holding capacity of the base, thus there are no complications, and resolution proceeds along regular lines.

To secure the complete removal of the incrusting ingredients, sufficient free or available sulphurous acid to sulphonate the lignin need be provided, and as variations in the proportions of this substance occur, it is advisable to have excess sulphurous acid in the liquor at the start of the digestion, the surplus being liberated and readily removed in the manner already described. Or the excess may be otherwise removed.

Any increase in the proportion of the pectose constituents requires a corresponding increase in the percentage of the base, but under all conditions excess of this must be provided as it ensures complete resolution and the consequent slow reduction of the liquor strength in the last stages of the cooking.

Having enumerated the principles of our invention, we now give working details of a method as applied to the common bamboo of the West Indies.

This bamboo must be very thoroughly and uniformly crushed, cut into convenient lengths, and packed into a vertical digester with acid proof lining. Between

10 and 12 lbs. of the crushed material can easily be packed into each cubic foot capacity of the digester, and about one gallon of liquor is required for two lbs. of bamboo, or on the weight basis this means roughly 5 to 1.

A suitable liquor made in a known manner from a magnesium base gives the following SO_2 analysis:—

	Per Cent.
Total SO_2	3.25
Available or free	1.80
Combined	1.45

When the digester is furnished, the lid is fixed and a small exhaust pipe connection is made to a cooling coil which has a free outlet into an absorption apparatus forming part of the liquor making plant. The steam is applied to the digester and the full gauge pressure of 7.5 lbs. or 5 atmospheres is reached in three or four hours.

The air and surplus sulphurous acid comes off very rapidly during the heating up of the contents, and the full capacity of the outlet is then required, but thereafter, to prevent steam waste, it can be curtailed by partially shutting the outlet control cock. The rate of gas liberation in the further stages of the cooking is relatively slow, and thus a smaller outlet is sufficient.

Under these circumstances the condensation of steam in the cooling coil during the cooking amounts to 15 per cent, or 20 per cent of the volume of the liquor added, and the sulphurous acid recovered is 20 per cent to 25 per cent of the original.

The removal of the surplus or gasified SO_2 is necessary for the chemical reasons already stated, for if this is not thoroughly effected the acid unduly preponderates, preventing the alkaline base from having freedom to remove the pectose constituents or completely upsetting the chemical equilibrium and depositing the aldehyde.

Care must therefore be taken to ensure that all the gasified SO_2 escapes from the liquor, and to a certain extent the process can be hurried by arranging for a larger steam escape in the later stages of the cooking, as this more rapidly carries off the traces of free SO_2 , allowing the base to more quickly effect the removal of the coloring and gummy substances.

After reaching full pressure, ten to twelve hours are required to complete the cooking process, this being carried on until the total sulphurous acid percentage contents of the liquor, as ascertained by direct test with standard iodine solution, is very much reduced. A suitable and satisfactory final strength, where dry steam has been used, is about 1 per cent.

When this stage is reached, the steam is shut off, and that contained in the digester is either blown out direct to atmosphere, or it can be condensed through a cooling coil, though the latter process is not necessary from the point of view of sulphur economy, seeing the bulk of this element which is not required in the chemical action has already escaped and been recovered.

After the pressure has been sufficiently reduced, the contents of the digester are blown out, and the resultant pulp is of a greyish white color. The yield is fairly 50 per cent of the original weight of bamboo crushed.

The pulp can be bleached by ordinary methods to a fine white with about 12 per cent of bleaching powder calculated on the dry weight of pulp.

Talc in Paper Making

Loadings used in paper manufacture not only increase its weight, but give it the necessary whiteness, opacity and absorption, and also improve the surface of the finished goods.

Progress in paper chemistry and machinery construction has given new impetus to the employment of minerals which have been wrongly looked upon as mere weighting agents. Now it is fully understood that certain papers cannot be made, or at any rate will not be put to their intended uses without the use of a filling such as china clay, and lately talc has also been found to possess certain advantages. The Austrian firms interested in talc have gone deeply into the question of the various uses to which it can be put. The whole of their information as concerns the paper trade has been placed at our service, and we need hardly say that the Austrians have by no means a monopoly of the talc supply.

The Austrian paper-makers report as follows respecting certain uses of talc:—

1.—They had been vainly trying to produce marketable Chinese absorbent paper; it was only after using talc that the paper passed as a good imitation.

2. They have used fine talc for rotary printings with success.

3. Blottings made of mechanical pulp with an addition of mineral loading are more absorbent than those made from rags.

Very little starch is necessary for the maintenance of talc in pulp. No mineral can be compared with talc for superficial affinity. When combined with rosin size it gives a very considerable degree of impermeability to water to the paper. A well-known lithographer recently stated that paper prepared with talc answered all his requirements. Some paper manufactured for chromo work contained 19 to 20 per cent talc. When burnt it gave 15 per cent ashes. The composition of the paper was as follows: 50 per cent wet pulp, 20 per cent cotton, 20 per cent talc, 10 per cent waste papers, plus size and color. This produced a paper of superior quality which took the most delicate impressions.

Action of Talc During the Various Phases of Manufacture.

Animal Sizing.—Experience has shown that animal sizing is more effective in papers to which talc has been added, as the size distribute itself equally in the web and corrects the tendency of the paper to wrinkle through expansion and contraction.

Damping.—Talc papers can be more evenly damped than other papers, as the fine talc particles have no tendency to deposit themselves on the wire on the underside of the web.

Glazing.—The addition of talc for the production of ordinary or fine papers, whether machine or calender glazed, is of great advantage, particularly for papers containing mechanical pulp and intended for illustrations, as well as for papers to be used in the manufacture of opaque envelopes.

Reeling.—Papers containing talc have a certain suppleness, and as the paper extends in a uniform thickness on the wire the reeling and re-reeling can be accomplished without difficulty, as there is an absence of dust and friction, and the rolls of rotary machines can be tightly rolled.

Cutting.—The work of the slitting and cutting machines is greatly facilitated, as talc prevents the formation of blisters and other irregularities during the

felting of the paper, and gives a suppleness to the sheet which makes it lie flat.

Strength.—Comparative trials have shown that paper loaded with tale is exceptionally strong.

Beating Errors.—When pulp has been beaten excessively, the addition of a determined quantity of tale puts matters right. This especially applies to such papers as must be free from a parchment-like appearance.

Employment of Tale for Various Papers.

Writing Papers.—The uniform distribution of the tiny particles of tale on the vegetable fibres results in the production of a high-class paper.

Document Paper. A lasting whiteness can be imparted to the best rag pulps if a slight quantity of tale is added to the beaters and a good free rosin size is used. Papers so treated can be used with advantage either for writing or printing.

Book Papers.—A limited quantity of tale in book papers containing large or small proportions of wood pulp and straw improves the opacity and improves the surface for writing or erasing purposes. A mixture of potato starch and tale to the sizing is also a great improvement.

Note Papers.—Very thin note papers cannot contain any mineral loading, but for the thicker sorts made from wood pulp it is advisable to use a small quantity of tale. If the tale is of superior quality it will be difficult to distinguish such papers from those made from rags. The addition of a good mineral loading also gives note papers the required quality for writing or typewriting.

As tale distributes itself very evenly, it imparts a glossy surface to paper which permits of rapid writing. It also diminishes the transparency, and is a great factor in making paper lie flat and remain so, even after having gone through the copying machine.

Typewriting Papers.—Fine qualities of tale should be used in the production of typewriting papers. It ensures clearness of type, and enables more copies with carbon paper to be made at a time than in the ordinary way. Press copied paper will not smear, and the sheet will retain its even surface.

Envelope Paper. When making these papers both the quality of writing and folding have to be taken into consideration, and when opacity cannot otherwise be obtained minerals have to be used. For this purpose tale improves the character and appearance of the paper, and assists in the production of a high glaze. When well calendered and otherwise properly treated paper containing tale can be used to great advantage for the production of high-class envelopes.

Legal Stationery. Though the employment of mineral in these qualities is somewhat limited, yet the use of tale in the thicker sorts is of considerable advantage as these papers must possess the double nature of a writing and printing paper, and are often used as typewriting papers. The employment of minerals, therefore, and especially of tale, greatly facilitates the production of paper requiring all-round qualities.

Music Papers.—These are made in various qualities, and the addition of minerals is more or less necessary in order to increase the plastic effect of the surface, and make the reading more easy, as the addition of minerals diminishes, or even quite abolishes the transparency of the paper. Music papers are very much exposed to light, and therefore quickly discolor, but those loaded with tale have been found to withstand the action of light to a remarkable degree. The discoloring of mechanical pulp is much reduced, and completely avoided in the sorts made from cellulose. As

in all special papers the manipulation of the materials and their work on the machine are of great importance.

Printing Papers. The use of tale in the superior qualities which require light sizing ensures suppleness, and is most economical. Tale gives a close surface, secures a uniform thickness, and facilitates the printing. In making papers for half-tone work the employment of tale is very important, as the tale intimately binds itself with the pulp so that no dust is produced during rotary printing, and the resistance is relatively very little influenced. The suppleness and elasticity of the produced sheet enables it to adapt itself so closely to the printing rolls that even at high speed the blocks and type come out neat and clear. The dust generally attributed to the minerals used has been found more than once to be composed of vegetable matter and not mineral. Tale prevents the formation of dust, as it is an agglutinant for rag fibres and for chemical and mechanical pulps.

Bank Notes.—Very little mineral substances are added to these papers, but a small amount of fine tale gives them resistance against repeated rubbing and folding, and favors the fineness of the designs that have to guarantee the printing against fraudulent imitations.

Lithographic and Map Papers.—Bad results given by faintly glazed papers for lithographic and typographic purposes have been obviated by the judicious addition of a mixing of superior tale in the beaters.

Illustrated Papers. The addition of tale to pulp used in the production of faintly-glazed papers for illustrative purposes secures the required results.

Artistic Printing Paper.—The extreme fineness of tale favors its use for the production of the finest papers intended for artistic printing. Its addition facilitates the fixing of coloring matters. Moreover, the irregular composition of the sheet after sizing with potato starch, casein and silicate, which is generally unavoidable, is quite overcome when tale is added to the preparation.

Advertisement Papers.—The appearance of these, in spite of their inferiority, is of primary importance, while their durability is practically of no consequence. Tale is a very valuable assistant in the production and prospectuses. As regards posters, it has the particular advantage that old posters do not show through those pasted over them.

News Papers.—Tale increases the facilities of printing, diminishes the transparency, and makes the paper supple. The employment of this mineral is most suitable for flat or rotary printing. The opacity which tale imparts to the paper makes the type pronounced.

Drawing Papers.—As tale has the property of mixing itself intimately with the fibres and becoming transformed through the addition of rosin and casein into an agglutinant it favors the conditions required for a good quality drawing paper which must be elastic to allow erasing and wasting. The fineness of the tale ensures a uniform surface so that calendering can be diminished or suppressed, as a matt surface avoids the bad light effects.

Artistic Drawing Papers.—This kind of paper requires careful treatment in the beating and a liberal addition of tale ensures the production of clear designs on the finished paper. Thorough mixing in the refining machine is most essential.

Rough Drawing Papers.—As rough drawing papers need to be very resistant the refined pulp should not be excessively beaten. Light beating, however, results in a rough surface, which renders drawing difficult and its appearance ragged. To remedy this defect it is and the uniformity it imparts to the surface of paper.

and the uniformity it imparts to the surface of paper, tale is undoubtedly the best loading for these papers.

Absorbent Papers.—This class includes filter papers, blotting papers and brush-writing papers. With regard to the last-named, the Chinese usually attach to them under a sample giving the degree of the absorption required to secure good brushwork and to ensure good results with the ink used. Numerous trials are often necessary to obtain the required conditions, and in this instance tale has always given the most satisfactory results.

It is advisable to employ tale for blotting papers in which poplar pulp is included, whereas for rag absorbent papers minerals should not be used on account of their obstruction of the pores of the paper.

Paper Tubes.—Tubes employed for various textile purposes are produced at the rate varying from 60 to 600 per minute. If the adhering properties are not acquired a great deal of waste is incurred, and if by inattention or oversight a defective tube gets on the spindle the threads entangle and break, causing delay and loss. To avoid this tale should be added to the pulp to ensure proper adhesion of the tubes.

Wrapping Papers.—The employment of tale for cheap qualities is to be recommended as it reduces the losses sustained on the machine. The writer has been able to produce paper which had no oxidizing effect on the polished metal parts of the beater simply by adding a little tale to the stuff. This addition rendered the bleach that remained in the stuff completely ineffective. These papers must be weakened as little as possible in bleaching, and worked without chlor or acids. A small proportion of good quality tale has proved admirable in the making of papers for electrical purposes, as the pores were tightly closed, so that the electric wires were protected against atmospheric influences.

Packing Papers.—Packing papers and highly-glazed envelopes are made more supple and their strength unappreciably diminished if tale is added to the pulp. They do not crush during calendering. An addition of cheap tale to sugar papers ensures their suppleness despite their weight. Paper made with a liberal addition of tale can be used for wrapping butter instead of the more expensive parchment papers.

Envelope papers produced entirely from wood pulp and a proper proportion of tale have the character and appearance of papers made from rags or hemp, so that it is difficult to distinguish one from the other. For blotting materials that have to be bleached with sulphate 10 per cent of tale added to the beater results in the production of a paper that practically retains the original whiteness of blotting; whereas the non-loaded materials lose their whiteness more or less.

Acid-resist papers for needles are made damp-proof, and have a good surface and pleasing appearance if tale is added. Even those made from substitute are as supple as those made from rags. Papermaking.

SOOTY PARTICLES IN PAPER.

It often happens that in large towns particles of soot find their way on to the Fourdrinier and cause black specks in the paper. The only remedy appears to be to filter the air entering the shop through fine wire netting, as which case, however, fans may be necessary to overcome the resistance offered by the fine mesh to the entry of the air. The firm of Schering, at Berlin, has been compelled to adopt this arrangement for making the papers destined to be used for photographic purposes. The wire blinds have to be cleaned at frequent intervals, usually every Sunday.

The Waste of Rosin

An important Scandinavian paper mill has for a long time been carrying out researches directed towards the disuse of rosin for sizing printings. The printers complained, however, of the papers first sent to them without rosin size. They made three distinct allegations:—

1. That the ink went through the paper.
2. That the paper needed more ink to get a distinct impression.
3. That the act of printing disturbed the surface of the paper, causing fluff and dust.

Two remedies were soon found, and are here given under the heads corresponding to the complaints.

1. To remedy the overpermeability to ink, a special ink was made, containing more dry matter and no turpentine. Properly used, this ink gave excellent results.

(This has a very unpromising sound. When it comes to demanding that printers shall use a special ink, the paper maker will get left.)

2. To remedy the waste of ink, the fibres were more closely united, during the manufacture of the paper by adding some starch to the pulp and the plan answered well. Half a per cent of starch with a preliminary mordanting with half a per cent of sulphate of alumina fulfilled the purpose completely. Casein can be employed instead of starch.

Many experiments have shown that there was less loss of filling, and loose fibres, than when free rosin was added in the same proportions.

The fluffing trouble is not further alluded to.

In China, the cradle of paper making, the problem of producing machine-made papers without size has been solved in a very simple manner, the absorbent papers, made to be written on with a brush, being also regularly used for ordinary printing purposes. Nevertheless, the best qualities are sized like European papers, but to a less extent.

At the present day, in mills where the managers do know how to work scientifically, where the hollandering is badly done, and where the composition of the pulp is not suitable to the purpose intended, rosin is literally wasted. Experiment has shown that with coarse pulp, especially mechanical pulp, a small amount of rosin is sufficient, and that any further is sheer waste, as it has no further effect on the character of the web. Even with papers which must be strongly sized, it is generally possible to save rosin and at the same time to improve quality by adding a little bleached straw pulp.

The time when rosin was used, so to speak, as a filling on account of its low price, is past, and at the same time we often meet with mills having no just appreciation of the economy possible in its use. The dirtying of the wire and felts, and hence the necessity for their constant replacement by new ones is disregarded, but paper makers wishing to keep pace with the times should pay due attention to these points. —La Papeterie.

Balsam fir, a tree which a few years ago was considered of little value, is now in demand for pulp wood. This demand has been brought about by the enormous expansion of the pulp industry during the past two decades.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY.

MR. T. A. WELDON,

Vice-President of the Provincial Paper Mills Company.

A young man walked into the office of the E. B. Eddy Company at Hull on a Good Friday morning about thirty years ago and pleasantly inquired if Mr. Eddy was in?

"No! this is a holiday and we scarcely expect him around" was the answer of a member of the staff. "I beg your pardon," said the caller "I had completely forgotten about this being a holiday."

As he was about to depart a gentleman with long whiskers and smoking a pipe, entered. "There is Mr. Eddy now," came the information and, with that introduction, the visitor stepped up with the remark "my name is—Weldon—T. A. Weldon, of Toronto, and I heard that you were wanting a traveller to represent you in Toronto and Western Ontario. I am with the wholesale grocery firm of Sloan and Crowther."

"Come into the office," remarked Mr. Eddy, as he led the way, and right then and there began a friendship and close association between the two which lasted until the great capitalist match and paper king passed away a few years ago.

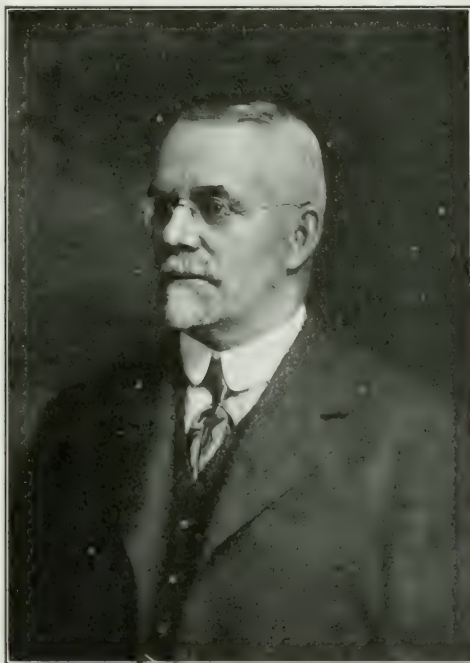
"Yes," said Mr. Eddy, after a general conversation. "I may tell you that we are looking for a man and we have had some eighty applications for the position already, a number of whom have sent their photographs along with letters and testimonials. But you are the first man who had the "sand" to come down here and spend twenty-five dollars to interview me personally. Now if there is one quality that I like it is "sand." I will come to a definite decision in this matter in a few weeks and, perhaps, you will hear from me later."

About two months after Mr. Eddy came to Toronto one day and inquired for Mr. Weldon, who happened to be out of the city. On his return in the evening he was informed of the visit and went down to the Queen's Hotel to meet the manufacturer from Hull.

"Well, I guess you can come to work for me," observed Mr. Eddy. "When can you start? I would like you to begin almost immediately." Mr. Weldon said that he thought he could make arrangements to that effect and was told of the territory he would be required to cover.

Not a word was said regarding salary. Mr. Weldon did not name a figure and Mr. Eddy never inquired what he wanted. When the former got his first cheque, however, it was much larger than he expected. Until five years ago when Mr. Weldon and other gentlemen, including his life-long friend, G. R. Copping, of Toronto, bought the plant of the Montrose Paper Mills at Thorold (then in liquidation), and assumed the control, resigning his position as manager of the Toronto branch of the E. B. Eddy Co., he was with the latter organization a quarter of a century. When he started with the E. B. Eddy Co., they were then making matches and certain lines of woodenware, their sulphite plant had just begun operations and they were thinking of branching out extensively in the news print and wrapping paper lines. After traveling a little over a year and meeting with splendid success, Mr. Weldon was requested by the Eddy Co. to take charge of the warehouse which they were

opening in Toronto, as they intended to carry stock and make the city a distributing point for Western Ontario, Mr. Weldon's brother, Robert, taking his place on the road. The first site was at 29 Front Street West and business grew so rapidly that soon a removal was made to 38 Front Street West. When the big Toronto fire occurred in 1904 and wrought such havoc in the down-town wholesale section, the Eddy company were among the sufferers who were completely cleaned out. Then the business was removed to 5 Front Street east where it was continued until



the erection by the firm of the large and imposing building at 73 Wellington West. In the course of his work Mr. Weldon called not only upon the wholesale trade but upon the newspapers selling news print. When he became identified with the Montrose Mill and was leaving to take up his residence in Thorold, the press of Toronto paid him many tributes, one leading publication, with which he had done business for many years, remarking that he "was the most widely known, the best liked, the most courteous and pleasant man in the trade with whom they had ever done business, and yet he always upheld the interest and integrity of his firm."

Going to the Montrose plant, the new manager at once set to work to overhaul it and expand the busi-

ness. How well this task has been accomplished may be judged from the fact that the output was then only about five tons per day. The old machine was given attention, new equipment added and later another machine, 140 inches wide, installed as well as a fine new mill built, making the output to-day about thirty tons of book, bond, writing and linenette papers, which command a wide market. The Montrose plant was subsequently merged with the St. Lawrence Paper Mills Co., whose mills are at Mille Roches, and at the head of which is Mr. I. H. Weldon, a brother of Mr. T. A. Weldon.

Later further expansions took place, the Provincial Paper Mills Co. was organized, and the historic and old established Barber plants at Georgetown acquired. Mr. John Barber retiring from the trade after half a century of active connection with it. The Provincial Paper Mills Co., of which I. H. Weldon is President, S. F. Duncan, Sec.-Treas., and Mr. T. A. Weldon, Vice-Pres. and Manager of the Montrose Division, are the largest concern of the kind in Canada and operate plants at Mille Roches, Thorold and Georgetown, being capitalized at five million dollars, and having an output of seventy tons per day of book, bond and writing papers, as well as a coating paper plant with seven machines. Their head offices are in the Bell Telephone Building, Toronto, and Mr. Weldon makes weekly trips to the city in the interest of the selling and administrative part of his division.

Of Irish extraction, Mr. Weldon was born on a farm in Cartwright township, in Durham county. His father came from Tyrone and his mother from Fermanagh, Ireland, and were among the pioneers of Ontario. They raised a family of seven sons and seven daughters. Later they moved to Oxford country, locating near Woodstock. The open air life on the farm and the active work performed by Thomas Andrew, who was the oldest of the children, laid the foundation of a strong constitution. He never knows a day's illness and his good health is as proverbial as his cheerful disposition. Mr. Weldon's parents are still living and St. Thomas is their home. His father has acquired the ripe old age of ninety-three and has been married over sixty-four years. He is still as supple and energetic in getting about as many men half his years. At the age of twenty, Mr. Weldon thought he would like to enter upon a business career, and learned the grocery line. He afterwards went south for five years, and settled in the State of Delaware, where he followed peach farming, at which he made considerable money. Returning to Canada, he attended a business college in Hamilton to round out his education and on the completion of his course, came to Toronto and joined the travelling staff of the firm of Sloan and Crowley (now John Sloan and Co.) covering Western Ontario and specializing in the sale of canned goods. It was while thus engaged that he formed his connection with the paper trade by entering the service of the E. B. Eddy Co., in the manner already narrated.

Many of the young men who are at the head of the big paper houses to-day, were mere beginners when Mr. Weldon first became identified with the trade thirty years ago. They called him "Tom" then and do so yet. He is genial and affable under all circumstances and, although a resident of Thorold only a few years, yet at the first social function in that town he was offered the Mayoralty without opposition, both candidates volunteering to retire in his favor. His business interests alone so began a portion of his attention that he had to decline, much to the regret of

the ratepayers. As a private citizen he has, however, taken much interest in the community and helped to advance its welfare in many ways, having seen it develop during the last two or three years into one of the most important pulp and paper centres of Canada, Thorold and Merriton possessing no less than nine or ten industries in this line, all of which are flourishing.

Mr. Weldon resides at "Hillcrest," a beautiful home situated on an elevation above the town of Thorold commanding a magnificent view of the surrounding country. Fond of a good story, he is generally able to tell one too. He often relates one regarding the late Mr. Eddy, who took him into his office one day shortly after he entered the service of the firm and, pointing to a line running from the top to the bottom of the wall, the paper magnate said "Do you see that line?" "I do," replied Mr. Weldon, "but I do not notice anything peculiar about it." "Well, it is perfectly straight," genially responded Mr. Eddy, "and now you can work for me as long as you keep like that." And Mr. Weldon did work for Mr. Eddy as long as he lived and for his company for some years after.

At curling, Mr. Weldon, when living in Toronto, frequently took a hand in the "roarin' game" with the Queen City Club. He is also a lover of horses and keeps a good stepper. In earlier days, it was his delight to mount an animal and take long rides. But paper interests are his chief concern now. At his work in season and out, he is a long way from being "weary in well doing" and in seeing that the customers of the Montrose mill get good service, prompt delivery and a superior product.

THE HYGIENIC VALUE OF PAPER.

It is hard to realize in our advanced state of civilization, the consequences of being deprived of what has hitherto been regarded as one of the necessities of life. The rumors of a shortage in the supply of paper in England on account of the war causes one to reflect, upon paper and paper-making itself.

Not until 1685 was the art introduced into England, but it is only within recent times that the possibilities of paper as a material of some hygienic advantages have been recognized. In an interesting paper upon the subject read at the Congress of the Royal Sanitary Institute at Blackpool by Dr. S. Rideal, D.Sc., the use of paper is recommended for home articles in daily use which require frequent washing. It is suggested that such movables as plates, cups, and even dustbins, should be made of paper, and destroyed when soiled. The use of paper handkerchiefs has been advocated for consumptives for some time past, and the paper serviette has come to stay.

The ordinary housewife, we fear, would think twice before being beguiled into substituting paper blinds, curtains, tablecovers, and towels in place of ordinary linen goods, sanctioned by custom and tradition. They might obviate danger of infection, being only used once, but, unless rendered non-inflammable, they would be highly dangerous. The use of paper disinfecting bags containing formaldehyde, for dealing with infected clothes, described by Dr. Munson, appears to solve some of the problems of domestic infection, while these receptacles are of service as emergency disinfectors for army use.

If paper bag cookery be not always practicable, there must be several ways in which more extended use of paper should appeal to medical men and sanitarians on hygienic grounds. Medical Press.

Ottawa Notes

Ottawa, Ont., November 10.—Lumbermen and paper manufacturers in Ottawa are now face to face with an increase in fire insurance rates of 50 cents on the \$100 on plant and lumber yards as a result of the unsatisfactory water situation in the Capital.

The Canadian Fire Underwriters' Association yesterday instructed all local insurance agencies to increase rates in Ottawa immediately. The increase is one of 50 cents on the \$100 for one year on nearly all kinds of mercantile and manufacturing risks, and all rates on lumber yards. This is partly due to the non-compliance of the city with the demand recently made by the Underwriters' Association that a new overland water pipe be installed by the city, and that meanwhile three new fire engines be purchased. The necessity of taking these precautions was urged on the City Council recently by a deputation from the Ottawa Board of Trade, of which Mr. E. R. Bremner and Mr. Gordon C. Edwards were spokesmen while lumber and paper manufacturers were active in advocating such a course. A letter written by Mr. J. R. Booth two years ago suggesting an overland pipe was also read at this meeting.

The insurance increase is a serious matter for lumbermen and paper manufacturers who are very large policyholders, and coupled with the fact that the rates are higher is the fact that the fire protection facilities at present afforded are, through the lack of water pressure, very poor.

There were two incorporations of pulp and paper companies at Ottawa last week, a somewhat unusual thing since the outbreak of war. The Nairns' Falls Power and Pulp Company was incorporated with a capitalization of \$100,000 and head office at the village of Malbaie, Que. Among its incorporators are Louis Alexandre Martin, civil engineer; Laurent Guilmartin Morin, broker, and William Edward Morgan, manufacturer, all of Montreal. The Chaleur Pulp and Lumber Company, Limited, of Montreal, will carry on a general lumber, pulp and paper business with a capitalization of \$75,000.

According to the Commission of Conservation the Laurentide Pulp and Paper Company of Grand Mere is making an experiment which has not been tried before by any Canadian paper company as far as is known. This is in the importation of reindeer from Dr. Grenfell's Newfoundland herd, to be used in the Laurentide limits, instead of sled dogs. It is thought they will prove more satisfactory than the latter.

The Laurentide Company is enlarging its forest nurseries with a view to ensuring the systematic replanting on a larger scale of cut-over lands unsuitable for farming in the St. Maurice watershed. The firm's forest division has surveyed and mapped the company's limits of over two thousand square miles.

That the delay in forwarding shipments of paper from Montreal is seriously inconveniencing New Zealand newspapers and other users of pulp products is indicated in a report to the Trade and Commerce Department this week by the Canadian trade Commissioner in Auckland, N.Z., who states that "importers of newspaper have very scanty reserves and the delay and probable non-arrival of the vessels from Montreal caused much anxiety. Some papers had only a few weeks' reserve in stock. Orders were therefore sent to England, but cannot be filled and delivered under

three months. The situation has been relieved somewhat by the arrival of supplies from British Columbia. There is also some anxiety with regard to the arrival of the Vancouver boats. The importers, however, are anxious to give orders on the Pacific Coast to save delay. There is a good demand for red paper. It is used for the covering of telephone books and just now a number of firms are in need of it to fill contracts with the Government. It would save time in this case if samples and quotations were forwarded so as to be submitted at once to importers."

The low water situation has not improved in the Ottawa Valley, in spite of recent wet weather. Only one lumber firm, the W. C. Edwards Company, is now operating, and the paper companies are in a bad way. Of course every effort is being made to operate as long and actively as possible, and with more rain and mild weather it is hoped by the purchase of quantities of outside pulp to continue paper manufacturing late into the fall.—MAC.

SEA-WATER FOR PAPER MANUFACTURE.

Can other than fresh water be used in paper-making? A writer in "The World's Paper Trade Review" states that there is no suitable method of removing the salt from sea-water, evaporation, being too expensive a process. It is, however, in some cases possible, with the direct use of sea-water to produce well-sized paper. Sea-water, it is remarked, is characterised by a high proportion of chloride of sodium, while the usual hardening components are present in a lesser degree (such as earthy alkaline metals, calcium, and magnesia). Though sea-water is salty, its effects in sizing are less injurious than those of many hard waters (such as final potash lyes when let run into river water).

When sea-water is used, a larger proportion of sizing substances will be required in paper-making, but in the former case papers with a resistant size can be made. The only question is whether the mill is advantageously situated for obtaining raw materials (such as fibrous substances and coal) and labour at a price which will offset the extra expense for sizing materials.

An important question is that of the sea-water to be dealt with. Qualitatively, the sea-water has the same composition at different points, but the various seas have very different proportions of salts in solution. The Baltic contains 0.66 per cent; the North Sea, 3.44 per cent, and the Atlantic Ocean a maximum of 4.26 per cent. Hence the analysis of the particular sea-water is a matter of importance. The effects produced on the sea-water by the waste water of the particular mill is likewise a point for consideration.

Another correspondent states that many mills have had unsatisfactory results from the direct use of sea-water. Among other difficulties has been the effect on brass and copper rollers. The paper produced is said, moreover, to be of a hygroscopic character, attracting the moistures from the air. It is added that to make its use practicable, sea-water requires to be distilled, which, however, increases its cost.

A Swedish factory had the experience that the pulp obtained with sea-water was of a soft and disadvantageous character. Its use is considered as limited to absorbent, cap, blotting and similar papers, while by reason of the wires and felts suffering, its normal and economical use is considered as not to be anticipated.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

Engineers have been busy during the past fortnight in the vicinity of the island mill of the Union Bay and Paper Company. It is reported that the men were employed by the D. and H. to lay out a side track from the Schenectady road to the mill. So far as can be ascertained there has been no change in the property, though a number of rumors have been current that parties have leased the mill.

According to a decision made by Judge G. W. Ray at a special term of the United States District Court at Syracuse, N.Y., banks that hold bonds against the Battle Island Paper Company of Fulton will be permitted at once to reduce them to ownership by public sale. It is probable since no outside parties desire the bonds that the banks will purchase them at a price which may be as low as from 10 to 25 cents on the dollar. The Syracuse Trust Company holds notes for \$40,000 and bonds with a face value of \$45,000, the City Bank, loans \$17,904 and bonds \$45,000. Third National Bank, loans \$29,500 and bonds \$40,000. Several other banks are represented among the bondholders of the Battle Island Company, the total issue being \$500,000. It is the hope of the bondholders to be reimbursed on the realization of funds from the prospective sale of timber lands owned by the company in Quebec, for which an offer of \$300,000 has been made, and upon the pending award of \$1,800,000 upon a barge canal claim. The last named, however, is problematical as far as the sum to be realized is concerned and upon Quebec lands prior Canadian liens would reduce the amount owed to \$135,000.

The recent appointment of Hon. John B. Madigan of Houlton, Me., as a member of the International St. John River Commission to fill the vacancy caused by the death of Hon. George A. Murchie of Calais, Me., means the early resumption of the commission's business. Among the most important matters to be decided by the commission will be the regulation of the power development of the Grand Falls of the St. John River. The development is regarded as the largest east of Niagara, the estimated maximum being 80,000 horse power. When the Commission has finally passed on the matter work will begin on a large pulp and paper plant by capitalists allied with the International Paper Company. Preparatory to the erection of the plant purchases of Maine timberlands on St. John waters have been made, aggregating more than \$1,000,000.

The Granite Paper Company of Fulton, N.Y., has finished its shipments of pulpwood from Canada, and has a supply of about 6,000 cords on hand at present.

The Entertainment Committee of the Paper Association of New York City have agreed at a date for the annual banquet, which will be held as usual at the Arkwright Club, 241 Broadway. The date chosen is December 9th, and every paper of prominence in the Greater Metropolitan district is expected to be present, many of them bringing guests from their mill connections.

Frank W. Summerville, an extensive dealer in pulpwood at Watertown, N.Y., says that the pulp and paper manufacturers of this country who are depending upon Canadian pulpwood entirely or in part, are going to be confronted with a serious situation within a few months. On a recent trip through Canada, Mr. Summerville found very few camps being opened up this winter. He says that the amount of pulpwood cut and peeled last year and now on the market is the smallest in years. The result is going to be that when last year's peel is exhausted there will be no more, and the manufacturers of pulp and paper on this side who are dependent upon Canada for pulpwood supply will be left in a bad fix. "What will be the outcome is hard to foretell," said Mr. Summerville. "The Canadian dealers ask more for their wood than the American buyers think they ought to pay, and the result is that there is little being bought at the present time."

The Great Northern Paper Co. will cut about the same amount of lumber this season on the Penobscot river in Maine as usual. They now have forty-two camps and will probably have many more. They will do very little, if anything, on the Kennebec. E. B. Weeks is their surveyor-general, and has about 40 sealers under him every season.

The total receipts of pulpwood at Portland, Me., from the Canadian provinces in the season which has just ended are 59,397 cords, an amount that compares well with the receipts of the past few years, with the exception of 1912, which was a banner year for pulpwood imports, something like 97,000 cords having arrived here.

The annual meeting of the Empire State Forest Products Association was held in Utica, N.Y., on Thursday, November 12, at the Hotel Utica. The committees that reported were the Legislative Committee, the Transportation Committee, the Forestry Committee, the Finance Committee, and the Committee to Forestry Associations in Conferences with other organizations. Under the leadership of Frank L. Moore, president of the Association, the organization has done a great deal for the wood industry of the State in all its branches.

Four paper makers of Watertown, N.Y., will go to France shortly to help out the paper-making industry in Paris on account of the curtailment of the labor supply on account of the war.

The Hoffman-Youman's Paper Mills operated by R. S. Hoffman located on the barge canal island at the south end of the dam, between the river and the barge canal, Baldwinsville, N.Y., was badly damaged by fire last week. No reliable estimate has as yet been made by Mr. Hoffman as to the extent of the loss sustained, but rough estimates made by others familiar with manufacturing plants, place the damage between \$50,000 and \$100,000.



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

FROM OUR LONDON REPRESENTATIVE

The latest research work concerning newspaper-making materials has been directed toward "Tambuti" (or "Tambookie") grass, (*Cymbopogon validus*), which grows profusely in Natal, the Transvaal and other parts of South Africa. The report which has now been issued is somewhat encouraging. A sample was submitted weighing 12 lbs. and consisted of lengths up to about 5 ft. 6 in., the stems measuring about 1-6th inch in diameter at the base. A chemical examination of the grass gave the following results and the corresponding figures for Algerian esparto grass are included for the purposes of comparison:

Tambuti, Esparto.
P.e. P.e.

Moisture (on drying at 100 deg.—110 deg. C.)	10.2	8.8
Ash expressed on dry material	7.4	3.0
Yield of unbleached pulp (dried at 100 deg.—110 deg. C.)		
(1) Expressed on material dried at 100 deg.—110 deg. C.)	41.3	32.3
(2) Expressed on material air dry material	37.1	29.5
Loss on weight of pulp on bleaching	3.1	1.3
Yield of bleached pulp dried at 100 deg. 110 deg. C. expressed on original material dried at 100 deg.—110 deg. C.	40.0	32.0
	inches.	inches.
Length of ultimate fibres	0.012	0.012
	to 0.188	to 0.12
Width	0.081	0.045

The report says that, on heating with caustic soda solution under pressure, the Tambuti Grass was readily converted into a light fawn colored pulp, which was very easily bleached to a pure white product. It will be noticed that the yield of pulp is unusually high, whilst the average length of the ultimate fibres is considerably greater than in the case of Esparto Grass. Papermaking trials that have been carried out show that a paper of fairly good strength can be produced from Tambuti pulp and specimens of both the bleached and unbleached product have been on view in London. The report concludes: "The high yield of pulp of good quality, and the ease with which the pulp is bleached, show that Tambuti Grass is well adapted for paper-making and the crude material would probably be worth about £4 (equal to \$18.20 per ton in London). It would, however, probably be more remunerative to convert the grass into 'half-stuff' in Africa and either ship the 'half-stuff' to Europe or utilise it locally for the manufacture of paper."

The attention of Canadian paper manufacturers should be drawn to the fact that in most of the neutral countries, in addition to the United Kingdom, special reports by trade commissioners are being made on openings in the Dominion for paper men to do busi-

ness. The British Board of Trade has included its report in a Bulletin issued on the German and Austro-Hungary competition. The German competition in Canada is stated to be pretty keen in Canada. At the present moment the Canadian Pulp and Paper Association should prove most useful in handling the local trade prospects through the influence of and by the help of the Dominion Trade Boards. Also, if legislation is wanted, now is the time to move. In London the Paper Makers' Association and the Board of Trade have had several conferences and consultations, but the results are kept confidential and very rightly so. We do not know what the future has in store.

Toward the end of November the British Wood Pulp Association will meet, but owing to the war it has been decided to have no banquet this year. The function was always a most elaborate affair, and pulp men of all nationalities gathered round the festive board. In the first week of November the Paper Makers' Association will meet to discuss the present state of trade, after which an alfresco dinner will be held. The paper-makers, as a rule, say very little for the information of the outside world—they believe in the old adage, "Silence is Golden." The reporters, however, do not think so.

The question of dyestuff and coloring materials is still a problem amongst the British paper-makers. They are paying heavily for anything they require, and wall paper men are feeling the position very keenly in the mills, so much so that the output is reduced enormously. Fortunately stocks are fairly heavy.

The Wall-Paper Manufacturers, Ltd., have issued their annual report for the year ending August 31, 1914. It states that the profits for the year amounted to £151,499 17s 3d, and £114,697 have been carried forward to next year's account.

Sir T. Vansittart Bowater, Lord Mayor of London, (head of Bowater and Sons, paper-makers, etc.) retires from office in November. He has made a brilliant Lord Mayor. The other day he entertained to luncheon some of the paper trade journal proprietors, amongst whom was Mr. S. Charles Phillips, owner of the "Papermaker," who has just returned from an exciting and interesting tour in Belgium and France. By the way, Mr. Phillips' son has volunteered for active service and has been given a commission.

British mills are going strongly in favor of electricity and scarcely a month passes by but reports are made that it has been introduced either for power or lighting purposes. Recently there has been quite a rush on electricity.

Mr. O. O. Wrigley, of one of the Bury paper mills, is providing a hospital for wounded soldiers. He has also contributed \$2,400 to the Belgian fund for the relief of distress.

DEPARTMENT OF TRADE AND COMMERCE SEES OPENINGS FOR CANADIAN PULP AND PAPER MAKERS.

The Weekly Report of the Department of Trade and Commerce points out some markets which are open to Canadian manufacturers. Mr. J. W. Ross, Trade Commissioner at Shanghai, China, gives a list of German exports to China, and intimates that the way is now clear for Canadian exports. German paper and cardboard to the value of \$382,500 and wood pulp valued at \$17,591 went into China last year.

Other countries' exports were:—

	Paper.	Pulp.
France.....	\$ 7,500	.....
Belgium	41,875	.....
Italy	1,875	.....
Austria-Hungary	68,750	.....
Sweden	963,125	.....
Norway	43,153	8,694

The reports adds that the total Chinese imports of paper, cardboard and strawboard in 1913 amounted to about \$4,000,000.

Contracts for wood pulp given to Scandinavian exporters previous to the war cannot be fulfilled and importers of this product are now looking to Canada for their supplies.

The Board of Trade Journal says of the Japanese paper trade:—The total capital of the thirteen companies forming the Association of Japanese Paper Mills is about 30,000,000 yen (£3,062,500), and the number of mills owned by them is twenty. The paper mills which are outside the association number eleven, including the Government Paper Mill and eight strawboard factories. The production of European styles of paper (except strawboard) in 1913 by the associated mills was 295,892,821 pounds.

Imports of paper in 1912 were 79,301,441 pounds, valued at \$3,456,347, and in 1913 83,340,361 pounds, valued at \$3,517,116.

Imports of packing and wrapping paper in 1913 show an increase in value over 1912 and 1911. This increase may be accounted for by the fact that the manufacture of such paper in the home mills does not keep pace with the growing demand all over the country for wrapping paper.

Although for several years the paper trade of Japan had been dull partly owing to the keen competition of foreign goods, at the commencement of 1913 the market began to show signs of improvement owing to the active demand for the products of the home mills. It was realized that their capacity was getting inadequate for the growing demand and consequently several companies decided to extend their plants, some of which have already been completed. A sudden setback, however, was experienced in the summer of 1913 and towards the end of the year all the mills were more or less overstocked in all lines except newspaper.

The following inquiries have been received:—

1109. Wood pulp.—A correspondent in Spain reports a demand in that country for Canadian wood pulp in consequence of the suspension of Swedish supplies.

1125. Pulp.—A Japanese importing firm wishes to get in touch with exporters of Canadian pulp.

In writing to the Department in reference to the above correspondents should quote number.

SWEDISH PULP SITUATION.

"Åkersvarlden," Sweden, says, October 21:—

Mechanical Pulp. We are informed that the reduction of the output on account of the water famine is estimated at about 130 tons of dry pulp and about 600 tons of wet pulp per day, including such output at the paper-mills, which is for consumption at their own mill. From all parts of the country, excluding Norrland, a very low water-level is reported and prospects for the winter are indeed very bad.

Chemical Pulp. It has now been confirmed that the stocks at the cellulose-mills in this country are very small, they are indeed very much smaller than at this time of last year, for sulphite as well as sulphate. On account of the large sales for prompt delivery which have been made since the war, the unsold quantity for delivery during the present year is also very small, the statistical position therefore is very favorable for the sellers. Prices are unchanged and firm.

HONORED BY STAFF.

On the occasion of his recent marriage to Miss Elizabeth Cornelia Van Vliet, third daughter of the late W. H. Van Vliet of Lacvolle, Que., Frederick J. Campbell, general manager of the Canada Paper Co., Windsor Mills, Que., was presented by the staffs of the Toronto and Montreal warehouses and by the mechanical and office staff at the mills, with a handsome Royal Windsor china set, accompanied by a congratulatory address.

REID CASE IS CONTINUED.

The enquete in the case of R. H. Reid, of New York State, who is charged with obtaining by false pretence 7,500 shares of the Labrador Pulp and Lumber Company, is being continued before Judge St. Cyr in Montreal. The charge against Reid, who is a member of the Montreal Stock Exchange and prominent in local financial circles, is laid by John McMartin, of Cornwall, Ontario; and of Montreal, who alleges that on or about the first day of April, 1909, Robert Reid, contractor, obtained with intent to defraud by false pretences, from the Labrador Pulp and Lumber Company, Limited, seven thousand five hundred shares of the common stock of that company, totalling in value \$750,000. Mr. McMartin swore to the complaint before Mr. Corvieux, the clerk of the Crown and Peace.

A sensation was caused by the fact that Reid, while out on \$40,000 bail, was re-arrested on information received at detective headquarters from Chief of Police John A. Rodland of Halifax that the accused was wanted at that city on a charge of dealing with a forged document knowing the same to be forged.

PAPER TRADE IN THE WEST.

John Martin, of the John Martin Paper Co., Winnipeg, which has branches in Calgary and Edmonton, has been paying a visit to the trade in Toronto, Montreal, Holyoke and other eastern centres. Recently he celebrated the twenty-fifth anniversary of his advent in the paper industry. Mr. Martin makes trips twice a year to the various firms that he represents in order to keep closely in touch with manufacturing conditions, new lines output, etc. He reports that business in the west in the paper line is rather quiet at the present time but during the past few weeks, has greatly improved. He looks for a decided betterment in the spring.



NEW PATENTS



BEATING-ENGINE AND EXTRACTING APPARATUS FOR MAKING CELLULOSE.

BURDETT LOOMIS, of Hartford, Conn., Patentee.

Patented August 25, 1914.

According to the inventor's description, this invention relates to a closed beating engine and connecting apparatus for digesting woody material and plants to make cellulose, and preparing finished paper stock directly in the engine; also for saving extracted natural constituents such as tannic acid, fatty acids, volatile and other oils, gums, and resins, and re-using fatty acids and other solvents in a subsequent operation.

The principal object of my invention is to provide an improved construction of beating engine, in which woody and other fibrous material may be reduced to pulp or cellulose under pressure, and in which the material may be caused to circulate while subjected to the action of a beating drum and blades till a washed, clean and bleached cellulose is prepared ready for paper making.

Another object is to provide special means in a closed digester and beating engine, for causing a forced circulation of extracting and dissolving liquor and fibrous material or pulp, whereby every part of the fibrous material may be repeatedly subjected to the action of the beating drum and blades, and the mass of material agitated for facilitating the extraction and removal of oils, gums and resinous matter.

Another object is to provide an apparatus, including a closed beating engine and extractor for circulating hot water or solvent liquor, reheating such water or liquor, separating and storing watery extracts, such as tannic and other acids, volatile and other oils, and resinous and gummy matter from wood and plants whereby great economy may be effected and improved products obtained.

Different kinds of wood and plants contain a variety of constituents, such as tannic and other acids, gums, wax, turpenes, oils and resinous substances, according to the character or kind of wood or plant, which substances are not useful or desirable in cellulose for making paper, in fact, detrimental thereto, but which, if separated from the wood and from one another, are quite valuable for use in the arts, and which when separated, leave the fiber of wood or plants in the cleanest and best condition for making superior pulp or cellulose, with a reduced expenditure of time and labor and a reduced percentage of chemicals, heretofore required for that purpose.

My apparatus is especially adapted for extracting and separating the various useful constituents and utilizing them as far as possible in making cellulose.

The matter constituting my invention will be defined in the claims.

I will now describe my apparatus by reference to the accompanying drawing, in which—

Figure 1 represents a sectional elevation of a closed beating engine, and extractor constructed in accordance with my invention. Fig. 2 represents a sectional elevation of a beating engine and connecting appara-

tus for separating and collecting extracted material, a reheater for solvent liquor, a gas heater and connections, and other devices for collecting and saving useful products.

In the apparatus I provide seven principal parts or devices consisting of a beating engine and extractor 1, an expansion and depositing chamber 30—30a, heating coils 36 located in a furnace below the bottom of engine 1; a condenser 32, a gas heating coil 44 in a furnace, a gas force pump 62, and a disintegrator tank 68, these parts being suitably connected by valved pipes, and a circulating force pump being connected by valved pipes, and a circulating force pump being connected in the system.

The closed circulating and beating engine 1, may be constructed of cast iron or other suitable metal, and has four principal body portions, consisting of the lower transverse horizontal body 2—2b, and connections 3—4a, an upper inclined conveyor pipe or trunk 4, and an upright end 5, suitably connected together to form a circulating chamber for fibre material and treating liquor or water. To one end of the drum-chamber 2a is connected a T 2b, having an opening and a cover plate a for permitting inspection, or for other desired purpose. To the other end of chamber 2r is connected a corner T a, having a blow off or discharge pipe 3a. To this T is connected an upper cross 4a, which in turn is connected to the inclined transverse conveyor pipe or trunk 4. These castings are bolted together at their flanges. The cross casting 4a has a top opening which is closed by a cover plate 4b, also an outer end opening which is closed by the thrust plate 4c, having a socket 15, containing a thrust collar and washer, for the end of shaft 13. To the trunk 4, is connected an angle cross casting 6, to which is also connected the top mouthpiece 6a and the upright pipe connection 5, which connects at its lower end with the lower corner T connection 5a, which has a supporting web 5b. The upper flanged end of the mouthpiece is provided with a circular groove for receiving the cover 7, which is provided with a circular rib to make a tight joint with said groove. The cover will be secured in place by bolts 7a and is provided with a screw-eye 7b. The casting 6 is provided with a circular shoulder 6b within the mouthpiece 6a, for supporting a perforated screen plate or sieve 10. To the cover 7 is secured a pipe or rod 9, having a flange at its lower end, to which is connected the plate 10, so that the said plate may be removed with the cover. The mouthpiece is provided with a discharge pipe connection 8, connecting with a discharge pipe 8a, which connects with the expansion and depositing chamber 30 and is provided with a valve b.

In the pipe or trunk 4 is placed a screw conveyor 12, having a shaft 13 resting at its lower end in the socket 15, and passing at its upper end through a stuffing box and plate 14. In practice a belt wheel or any suitable gear wheel will be secured to shaft 13 for turning the screw conveyor.

The corner casting 5a is provided with a pipe connection 16 for the return circulating pipe 33 leading from the top of the heating coil. Within the casting 5a is extended an injecting pipe 17, as a continuation

of the return pipe 39. This serves as one of the means for causing a forced circulation through the beating engine.

In the chamber 2a is mounted a beating drum 18 on a shaft 19 in a journal box 20 in a well known manner. Below the drum, in a suitable casing is placed an adjustable bed plate 21, having the usual knives or blades, and made adjustable toward or from the drum by special adjusting mechanism 22 in a casing 23. A clean-out door 24 is provided in the lower part of the drum chamber. The upper wall of the drum chamber 2a is suitably curved to conform approximately to the curve of the drum, but so as to approach it closer at the upper corner 2c of the chamber. The drum will revolve in the direction of the arrows. The opening between the upper wall and the drum is flaring from the narrow slit 2c to the wide opening 2d. The construction of the upper wall serves to prevent most of the fibre material from circulating around with the drum.

To the mouthpiece 6a is connected a water and vapor discharge pipe 8a, having a valve b, which connects with an expansion and depositing chamber, 30—30a, at the top of which connects a vapor discharge pipe 31, having a valve c, leading to a condenser 32.

The expansion and depositing chamber 30—30a is of a suitable height and diameter to provide for expansion of the vapors and partial cooling of the liquor to facilitate deposit of resinous or gummy material. At the lower end the chamber is made with tapering walls terminating with a discharge pipe having a valve g for drawing off gummy or resinous matter.

A steam coil 38 is placed in the lower end of the depositing chamber for melting gummy or resinous material in case it becomes cold and hardened. At about the middle height of chamber 30—30a is placed a separating dome or hood 33 which may be attached at its edges to the wall of the chamber, as shown in Fig. 2. In this construction the outlet pipe 34 connects with the wall of chamber 30a at the top of the dome and is provided with a valve e. The dome 33 is located below the connection of the water and vapor discharge pipe 8a from the engine and extractor 1 and provides a vapor expansion chamber or space 30 above it, and a depositing or catchall chamber or space 30a below it. This dome acts as a deflector and separator to cause the resin or gummy matter to be deposited in the bottom of the chamber while the water or treating liquor flows up into the dome and thence off to the circulating pump 45. A positively acting rotary pressure pump 45 is preferably used, though some other kind of positive pressure pump may be employed. A discharge pipe 35a connects with the pump and leads to the lower end of a series of heating coils 36 suitably supported in a furnace 47. These coils are connected in a series by means of return bends h which extend through the wall of the furnace. Near the bottom of the furnace is provided a perforated arch 37a for distributing the gas flame and protecting the lower heating coil. A fire chamber is provided below the arch 37a. Gas is preferably burned in the fire chamber and is supplied by a pipe 49 having a valve k' and a burner or a suitably kind in the fire chamber.

In order to secure satisfactory heating and circulation of treating liquid through the apparatus, the engine is located so that the top thereof is below the bottom of the engine and extractor 1.

To the top of the heating coil is connected a return pipe 39 of the circulating system, and this pipe is also

connected to the pipe connection 16 at the bottom of the engine 1. The pipe 39 is provided with a check valve f. A check valve f' is also placed in the lower end of pipe 35a at its connection with the coil. These check valves prevent back flow of water from the engine. A water supply pipe 41, having a valve l connects with the mouthpiece or may connect at other desired part of the apparatus.

A second heating furnace 42, containing a gas heating coil 44 is provided for heating gas to be used, if necessary, in drying the contents of the beating engine after a material has been treated with a solvent solution. A gas supply pipe 43, having a valve n supplies a burner o in the furnace. A gas supply pipe 45, leading from a gasholder 46, and having a valve p connects with the heating coil 44. A pipe 47 leads from the coil into the lower part of the engine 1, and is provided with a valve q. An outlet pipe 50, having a valve t, connects with the mouthpiece 6a, and leads to a second condenser 56 from which a pipe 57 leads to a rotary exhaustor 58. The condenser is provided with a draw-off pipe and valve w. A pipe 59, having a valve r leads from the exhaustor and connects with the pipe 47a, connecting with pipe 45. A branch pipe 60, having a valve x connects pipe 59 with the holder. Gas drawn from the engine and extractor may thus be returned either directly to the heating coil or to the holder. Cold gas may also be passed from the holder through pipe 47a, having a valve p', into the beating engine.

A compression pump 62 may be used to draw gas directly from the holder 46 through pipe 66, or hot gas from the heater through pipes 66, 66a and 47, and discharge it through pipe 63, and branch 64 in the top of an elevated feed tank 61, for holding alkaline chemical or bleaching liquor. The pipe 66a has a valve e'. A pipe 62a, having a valve z connects tank 61 with pipe 50 leading to the mouthpiece 6a of the engine. The tank 61 is provided with a cover y and its supply pipe 64 is provided with a valve a'. A branch pipe 65, having a valve b' connects with a pipe 63 and with the mouthpiece 6a for admitting gas under pressure directly to the beating engine when required for blowing out the cellulose or other contents.

To pipe 39, leading from the heating coil 36 is connected a blow-off pipe 52, having a valve s and connecting with a storage and settling tank 51. To pipe 39 is also connected a draw-off pipe 53, which connects by a branch pipe and valve s' with a tank 54 and by a second branch pipe and valve t with another tank 55. These tanks 54—55 are provided respectively with faucets u and v.

A pulp receiving and disintegrating tank 68, is connected by a blowoff pipe 3a having a valve l' to the discharge pipe at the bottom of the engine and extractor 1, and is provided in its top plate with a target 69 against which the pulp is blown for separating and disintegrating it. The tank is also provided at the top with a purge pipe 70 having a valve 71 for the escape of vapors. Across the lower end of tank 68, about one fourth of its height from the bottom, is secured a grid and filter cloth 72, providing a compartment 73 below for receiving liquor and to the bottom is connected a drain pipe 74, having a valve d', for discharging the liquor. A pipe 75 connects with the bottom of the tank and extends up into compartment 73 where its upper end is provided with a plug 76, and this pipe serves for discharging the pulp after having been drained. A gas pipe 65a, having a valve

c', leads from a compression pump 62 and connects with tank 68 just above the pulp discharging nozzle 177 for supplying gas under pressure to carry off much of the watery vapor at the time the pulp is blown against the target 69, so that much of the black liquor, which would otherwise settle with the pulp onto the filter cloth, will be taken up and carried off with the gas. As a result of this operation there is left less liquor to wash out of the cellulose and, therefore, the cellulose will be much cleaner when removed from the tank. The purge pipe 70 will preferably connect by pipe 77 having valve b' with a condenser 78 for separating water or any other condensable matter from the gas. The gas, freed from condensable matter, will be returned to the holder or to a heater.

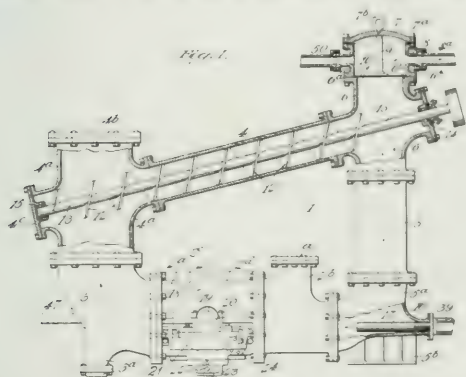
By constructing the beating engine and extractor as shown in Fig. 1, I provide for effectively circulating the fibre material and solvent, or other treating liquor, grinding action of the drum and blades of the bed and repeatedly subjecting them to the beating and plate. Four parts or devices are provided for aiding circulation, consisting of the revolving drum 18, the inclined screw conveyor 12, in pipe 4, the down take pipe 5 in which the weight of material aids by gravity; and the injecting pipe 17 leading from pipe 39 and the force pump 35. These parts work harmoniously together, and if the drum is stopped the other parts

fatty acids, gases and other products of decomposition when diffused in hot water are an excellent solvent for the cellular structure, the gummy and resinous material found in wood and plants, and that, if the mixture or solution is circulated in contact with the wood or plants to be treated the contained resinous matter, oils, and turpentine or other volatile oil will be quickly liberated and may be drawn off with circulating water. The turpentine and more volatile oil will pass off in the form of vapor and will be condensed, and the rosin and gum will pass off in a melted semi-liquid condition, and will be deposited and recovered. I have also discovered that the fatty acids and other solvents may be most effectively and economically produced and diffused in water by first heating fresh water and circulating it in contact with the wood, or plants to be treated at gradually increasing temperatures, ranging from 212 deg. to approximately 300 deg. F. The volatile solvent is readily extracted from the wood or plants and diffused in the water and the mixture is passed from the engine and extractor through a heater where the temperature is raised and is then circulated up through the wood or plants, in the engine and extractor. The circulation of the water and solvent in contact with the wood or plants and through the heater, the temperature being gradually increased, is continued till the solvent has liberated the turpentine, oil, resinous and gummy matter and these valuable products have been recovered. The treatment may be continued for six to twelve hours, according to the character of the wood or plants and the temperature of the treating liquor.

In the operation of preparing fatty acid solvent from the wood or other fibre material, hot gas, such as wood-gas or producer-gas, heated to a temperature between 200 deg. F. and 300 deg. F. in the coil 44, may be admitted to the engine and extractor through pipe 47 and circulated alone or with a suitable proportion of water through and in contact with the fibre material. By means of this circulating warm or hot gas for some time, thirty to ninety minutes, in contact with the fibre material the fatty acids, gases and other solvents will be extracted and formed from the wood and mixed with the water or other liquor. At the time the warm or hot gas is circulated, the volatile extract is preferably not drawn off and condensed, but is retained in the circulating fluid for its solvent action on the cellular structure and on the gummy and resinous matter. The extraction of fatty acids and other solvents by gas is rapid and is quite effective in connection with circulating water, when conducted substantially as above described.

I preferably first remove tannic acid from the wood or plant material, as it can be extracted at low temperature, between 120 deg. and 170 deg. F., and if left in the wood during the pulping operation, combines with the fibre, imparting thereto a dark color, and cannot then be washed out with water alone, but must be removed by alkali and bleaching agents, entailing additional expense.

In operating the apparatus, the engine and extractor 1, is partially filled with chips of wood or cut fibrous plant material through the mouthpiece 6a, at which time the cover 7, and screen 10, will be removed. The screen plate 10, will be attached to the flange of pipe 9, so that this screen may be removed with the cover. After the engine is suitably charged the cover will be secured in place by the bolts 7a. The whole system is now filled with water or a solvent liquor admitted by pipe 41 and caused to rise to the level of the discharge pipe 8a, at its connection with the expansion chamber



would still act to circulate the treating liquor through the fibre material for extracting tannic and fatty acids, volatile oil, other oil, gums, resins, etc., or for circulating a washing or bleaching liquid through the material.

By heating wood to a moderate temperature, ranging between 215 deg. and 245 deg. F., decomposition is set up, resulting in the formation of a number of acids of the fatty acid series and by raising the temperature there are formed other fatty acids. The formation of fatty acids, among which acetic acid appears in largest quantity, commences, according to Gillot at 255 deg. F. Other fatty acids are formed, such as formic acid, propionic acid, butyric acid, valeric acid, etc., at the above and higher temperatures. Simultaneously with the formation of these acids, carbonic acid, carbonic oxide and methane are evolved from the wood, and these bodies in a nascent state may act upon the acids so that the latter may undergo decomposition by more vigorous beating and a large number of products of decomposition may be formed. Among such products are found methyl alcohol (wood spirits), acetone and metacetone, methyl acetic ether, aldehyde and dimethyl acetal. I have discovered that these above-mentioned

30. Gas may now be admitted to, and ignited at the burners *k'* below the coils, and the circulating force pump 35 is started. This causes circulation of water being injected through pipe 17, for causing better circulation through the engine and extractor. The water is circulated at a temperature between 120 deg. F. and 170 deg. F. through the body of chips or plant material for first removing tannic acid. Circulation of water at this low temperature is continued until all, or most of the tannic acid has been extracted, then this acid solution is drawn into a tank 54, by opening the valve *s'* in pipes 53.

The system is again filled with water, or a fatty acid solvent solution made by a previous treatment of wood chips, and the pump 35 again put in motion, and the heat may be gradually increased in the furnace 37. As the circulating water becomes heated, approximately to 212 deg. F., some of the fatty acids are produced and passed with the water into the heating coils. As the temperature of the water is gradually increased other fatty acids, gases, and products of decomposition are formed and diffused through the water. The hot circulating water and the solvent fatty acids soon commence to dissolve the cellular structure and release turpentine, or volatile oil and gummy or resinous matter from the wood-chips or plants. The turpentine and other volatile oil vapor passed with the water or liquor into chamber 30—30a, where the volatile vapors separate and fill the upper part of chamber 30, from which they pass off through pipes 31, to the condenser 32, where condensation is effected. At the same time the resin or gum which has been released from the wood or plant material is passed with the water down past the separating dome 33, and the resin or gum is deposited in the lower part of chamber 30a, while the water passes up through the dome 33, and thence by pipe 34, the pump 35 and pipe 35a into the bottom of the heating coils 36, and thence through pipe 39 into the bottom of the engine.

By circulating the hot water up through the body of material in the engine the resinous gummy matter is carried upward and floated off with the water through pipe 8a into the expansion and depositing chamber 30—30a.

The circulating hot water or solvent liquor agitates the body of chips or plant material and prevents packing, and continuously carries away the extracted material so as to continuously bring fresh liquor into contact with the chips, thereby effectively exerting its solvent action on the cellular structure so as to release the gummy and resinous constituents. In the expansion and depositing chamber 30—30a the liquor is partially cooled and quieted, so that the resin or gum becomes hardened and will readily settle to the bottom of chamber 30a.

The temperature of the water or liquor may be gradually raised in the heating coils to approximately 300 deg. F., and it will become charged with an increasing percentage of fatty acids, gases, etc., and these act with increasing energy to dissolve, release and extract the turpentine, oil, resinous and other gummy matter from the material until it is substantially free from such constituents. The operation may be continued for a period varying from 6 to 12 hours, according to the character of the wood or plant being treated.

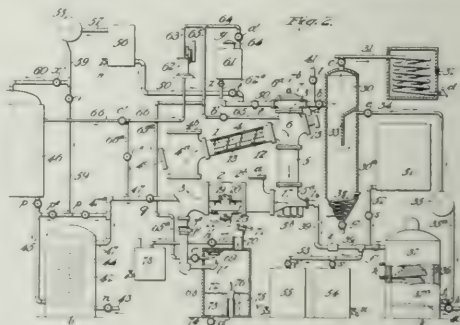
During the above described operation of extracting constituents from the fibre material the screw conveyor 12 may be operated to assist circulation and agitation of material in the engine. The pump 35 will also operate to force liquor through the heater and

thence through the injector pipe 17, thereby causing circulation thereof through the fibre material and up to the overflow pipe 8—8a leading from the mouth-piece to the expansion and depositing chamber 30—30a.

At suitable intervals, the valve *g* may be opened and the resinous or gummy matter discharged from the chamber 30a, but this may be mostly discharged at the end of the operation.

At any suitable stage in the operation, when the chip or plant material has become sufficiently softened and partially freed from gummy or resinous material the beating drum 18 may be set in motion and the material subjected to beating, rubbing and grinding while at the same time the hot solvent liquor is circulated through the engine.

When treatment of the material in the engine is completed, the valve *b* in pipe 8a may be closed and the blow off valve *s* opened, permitting the water or liquor containing the fatty acid to be blown off into the storage and settling tank 51, where it is reserved for treating a succeeding charge of fibre material in the engine and extractor. This blowing off operation may be facilitated by admitting compressed gas from pump 62 through pipe 65 into the top of the engine. The wood chips or other fibrous material in the treating engine will now be practically free from gum, resin, and oily matter, and the pores will be open so as to be readily permeated by caustic-soda or other solution.



The cleaned fibrous material may be conveniently reduced to cellulose directly in the engine, which now becomes a digester and beating engine, by admitting fresh water through pipe 41 and the desired per cent of caustic soda solution of sulphite of soda from tank 61. The beating drum 18, and the circulating devices will be put into operation at the desired stage of the process. The circulating pump 35 will be put into operation and the liquor caused to circulate in the direction of the arrows through the heater 36 and up through the material till digestion and reduction to pulp or cellulose is completed. The temperature may be raised to 250 deg. F., or higher if required, and at intervals more alkaline solution admitted from tank 61. Gas under pressure may be admitted by pipe 64 into the top of tank 61 for forcing the alkaline solution into the engine. Owing to the preliminary thorough preparation of the chips, or fibre material the percentage of caustic soda, sulphite of soda or other chemical used for digesting the fibrous material, will be very much smaller than that required in the ordinary process. The heat and pressure will be much lower, and the time will be much reduced for reducing the material to a good strong fibre pulp or cellulose.

The cellulose prepared as above described, freed from gums and resins, will be bleached to the desired extent with a comparatively small per cent of chloride of lime or other bleaching agent and thus great economy effected, while the cellulose will have greatly increased strength of fibre. The low heat and pressure employed in the digester also contribute to the strength of fibre. The low heat and pressure employed in the digester also contribute to the strength of the fibre in the cellulose.

Owing to the reduced amount of caustic soda and the shorter time required in digesting the prepared chips the fibre of the cellulose will have greater strength than that produced in the usual way.

After reduction the fibrous material, by digestion with alkali or alkaline salt, to pulp or cellulose, has been completed, that is cooked in the engine, I may draw off the alkaline liquor through pipe 3a, and admit fresh warm or cold water through pipe 41 to the digester and engine and circulate such water repeatedly through the cellulose by means of pump 35 and conveyor 12 for washing out the alkali and dissolved or saponified oily or resinous matter. The first wash liquor may be drawn off and fresh water again admitted and circulated till the cellulose is sufficiently clean. The finished cellulose may be blown off through pipe 3a to the disintegrating tank 68.

The cellulose having been produced, gas under pressure is supplied from pump 62 through pipe 65 to the top of the engine and then valve 1' is opened and the cellulose is discharged through blow-off pipe 3a and nozzle 1'' against the target 69 in the top of tank 68. Here the particles which adhere together will be disintegrated and separated. At the same time gas under pressure will be admitted through pipe 65, just above the discharge nozzle 1'', so as to catch the spray of liquor, containing coloring matter and some residue of gummy matter, and carry it out through the purge pipe 70. The top valve 71 may be open, so as to blow the gas and vapors into the open air, but said valve will preferably be closed and the gas and vapors conducted by pipe 77, its valve f' being open, to a condenser 78, where the liquor vapor will be condensed, while the gas will be freed and returned to the holder, or to a heater to be again heated and then compressed to be used over again for blowing out colored liquor vapor. Any liquor which drains from the pulp through the filter cloth 72 will be drawn off from compartment 73 as required. The pulp or cellulose may be discharged from tank 68 by opening valve 76 in pipe 75, into a bleaching or other tank.

By first extracting and removing the tannic acid from the wood, I prevent discoloration of the cellulose. The tannic acid is left in the treating tank combines with the fibre and becomes fixed so that it cannot be removed by ordinary washing, but must be removed by chemical treatment, entailing additional expense for chemicals and requiring additional time for treatment.

Strength, toughness and elasticity are characteristic of the fibre in the cellulose produced by my process.

LINER FOR WOOD-PULP DIGESTERS.

GEORGE ERNEST MILLER, Madison, Me., Patentee
—Patented in U. S. Patent Office, September 1, 1914.

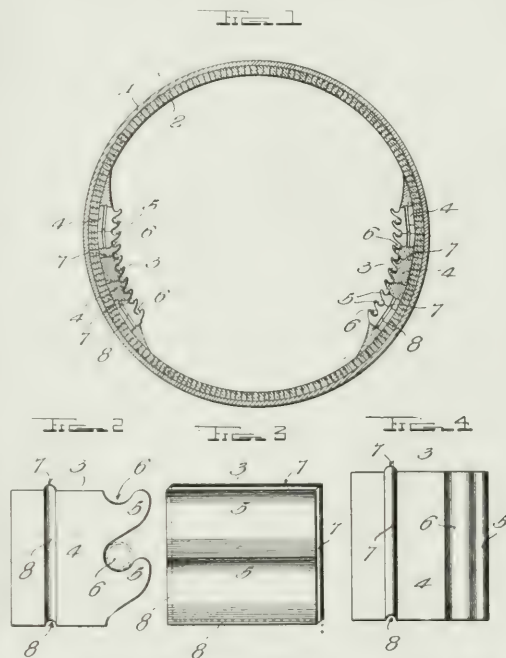
The inventor says: My invention relates primarily to digesters for cooking wood or other material used for making pulp, but more especially to the lining of the same.

One object of my invention is to provide an acid-proof lining for this class of digesters, having integ-

rally formed acid-proof pipe supports whereby the steam pipes or coils of the digester may be securely supported on the inner sides of the latter, the supporting means being unaffected by the acids used in the process of digestion.

Another object of the same is to provide a lining of this class which is inexpensive, easily constructed and that can be readily replaced when worn.

With these and other objects in view my invention consists of certain novel features of construction and combination and arrangement of parts which will hereinafter be more particularly pointed out and claimed.



In the accompanying drawings in which similar parts are designated by like characters Figure 1 is a transverse vertical section of an ordinary annular wood pulp digester, illustrating my improved lining and pipe support interiorly arranged on opposite sides thereof, some of the pipe supporting members being here shown in section and others partly in section; Fig. 2 is a side elevation of one of my improved liner and pipe supports illustrating the bead receiving channel formed therein; Fig. 3 is a front elevation showing the curved pipe supporting projection formed on the face of the liner; Fig. 4 is a plan view illustrating the locking bead carried by my improved liner and support.

Heretofore it has been customary in this particular art to support the steam pipes passing through the digester on the sides of the latter by means of bronze plates, but usage has disclosed the fact that these plates soon become corroded and finally destroyed, owing to the destructive effect of the acid used in the process, permitting the pipes to become displaced and fall into the bottom of the digester, with the result that a good deal of steam escapes into the pulp, damaging the quality of the same and much time is lost in replacing and repairing the coils, all of which means a great loss of production. And it is to overcome these

objectionable features that I propose to line the digester with acid-proof members having integrally formed hooks which retain the pipes in place.

Referring more particularly to the drawings, 1 denotes the cylindrical metallic casing of an ordinary digester, although I do not limit myself to this particular form of the same. Formed around the inner surface of the casing 1 is the usual brick lining 2 which protects the casing against the destructive action of the acids used in preparing the wood pulp.

Over a portion of the brick lining 2, on each side of the digester as clearly shown in Fig. 1 I propose to place my improved lining the individual members 3 of which consists of the acid-proof base 4. Formed on the upper surface of the latter are the longitudinally extending hook-shaped projections 5, the curved surface of which coats with the upper surface of the base and with the adjacent member to form the concave shaped sockets 6 which latter makes a perfect receptacle for the pipes used in digesting.

To properly retain the members 3 in position within the digester I provide two sides of the former with a centrally disposed and longitudinally extending bead 7, while in the remaining sides I form a similarly disposed channel 8. By this arrangement it will be seen that when my improved lining has been placed in position the bead 7 on the one member will fit snugly within the channel 8 of the other, thus forming a tongue and groove connection for the same. Of course, it will be understood that in some instances it may be desirable to cover the entire inner surface of the digester with my improved lining, in which case I would discontinue the use of the lining 2, and replace the same with my improved lining and pipe support cementing the tongue 7 within the groove 8 so as to prevent any of the acid from seeping through the lining and attacking the metallic casing.

From the foregoing it will be seen that when the individual members comprising my improved lining have been placed in position, the hook-shaped projections thereon will extend toward the center of the digester and form substantial acid-proof supports for the steam pipes avoiding the necessity of metallic supports, thus making it impossible for pipes to be displaced by reason of the destructive action of the acids used in the process.

Various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as claimed.

Pulp Wood for Pit Props

Special to Pulp and Paper Magazine.

Recently, owing to the war in Europe, quite a demand for pulp wood for use as pit props has sprung up in Canada and British colliery owners have sent their representatives over here to enquire into sources of supply and prices. Hitherto these pit props have been obtained from the Baltic and Gulf of Bothnia ports, but as shipments have temporarily ceased owing to the war, and Canada seems the only available source of supply, enquiries regarding them are being made all over the East in Quebec, New Brunswick and Nova Scotia.

Pit props can be of any kind of wood of the pine family, such as larch, spruce, fir and pine. They vary in size from 3 to 7 or 8 inches in diameter and from 4 to 12 feet in length. It is not necessary to free them from outer bark by hand peeling, though in nearly all cases

those from the Baltic were so treated, but the ends should be cut square across and each stick be straight. They are bought at so much per running foot of per cubic fathom. A cubic fathom consists of a pile of logs 6 feet cube or 216 cubic feet, the logs being laid side by side and closely packed together.

Obviously a cubic fathom or 216 cubic feet corresponds to 1.76 cords of 128 cubic feet, and by actual survey measurement to 1,000 superficial feet board measure. It may therefore be taken as substantially true that one cubic fathom of pit-props correspond to that quantity of logs which when sawn will yield 1,000 super. ft. one inch boarding.

According to the observations of the late Mr. H. M. Price, of Quebec, the number of round logs of different diameters required to make up a cord or a cubic fathom were found to be as follows:—

Diameter Inches.	Pieces per cord of 128 c. ft.	Pieces per c. fathom of 216 c. ft.
4 3/4	87	153
5 1/2	61	107
6 1-5	50	88
7 1-10	41	72

We understand the Provincial Governments have made certain concessions in respect to their restrictive laws in regard to the export of this small timber as pit-props, in order to help out the British colliery owners in their present plight, but whilst it is true the cost of such wood f.o.b. Canadian ports is not too dear, having regard to the prevailing average prices of pulp wood in Quebec, New Brunswick and Nova Scotia, it is equally true that the cost of freight is high and suitable tonnage almost unattainable. Freights from the Baltic to United Kingdom east coast ports on pit-props average from 24 to 26 shilling per cubic fathom (216 cubic feet) whereas from this side present season freights on sawn lumber average in the neighborhood of 40 shillings per standard, which corresponds to 165 cubic feet ship's space. The freight on a cubic fathom of closely piled round wood reckoned on this basis, would rise to 53 shillings. Eliminating the elements of insurance, etc., it would appear that the cost of pit props f.o.b. U.K. ports should figure out in the neighborhood of 93 shillings per cubic fathom, assuming the cost of the props to be 40 shillings per cubic fathom f.o.b. at shipping point. The fluctuation in price obviously greatly depends on the rate of ocean freight and as much of this trade from the Baltic is carried in sailing vessels, by employing the same type of ship for transport from Canada, the foregoing figure might be reduced.

We are of opinion that this business cannot become a permanent one to Canada, on account of the high cost of delivering the goods. When the war is over shipments of pit timber from the Baltic will be resumed as this is unquestionably the cheapest source of supply for the British market. The present demand in Canada, although of a temporary nature, will give timber land holders an opportunity of thinning out their forests and of utilizing the best of the tree tops and in this way may serve a useful end.

Winding up orders have been granted in the case of the Long Lake Lumber Company, of Toronto, which had a capital stock of forty thousand dollars and also in La Compagnie de Publication la Justice, Limited, of Ottawa, with a capital stock of twenty-five thousand dollars.

PULP AND PAPER NEWS

Major Joseph Kilgour, who is president of the Canada Paper Company, and also a member of the firm of Kilgour Bros., Paper Bag Manufacturers, Toronto, resides at Sunnybrook Farm, Eglinton, and this season again placed his property at the disposal of the Ontario Provincial Plowman's Association for the holding of their annual competition. Thirty-three teams were entered in the various matches and about two thousand persons were in attendance on November 6. Major Kilgour and wife served a hot dinner in the evening to some seven hundred guests and Mrs. Kilgour was presented with \$118, the gift of the assembled plowmen and their friends as a contribution to the private hospital for wounded soldiers at Folkstone, which is conducted by her sister, Miss Grand.

The annual meeting of the Spanish River Pulp and Paper Company, which closed its financial year on June 30 last, will be held shortly, word being awaited from the English shareholders regarding the exact date. As all the mills of the company have been working to capacity for some months, it is expected that the financial showing will be a very satisfactory one.

At a meeting of the Canadian section of the Society of Chemical Industry, held last week in Toronto speakers strongly urged a greater degree of co-ordination between the Government and educational institutions and between the manufacturer and the technical chemist as a means of advancing the chemical industry in Canada. T. H. Wardleworth, of Montreal, said that Canada should enjoy the entrance of free alcohol for technical purposes, and added that, as a result of the refusal of the British Government to admit alcohol free to the dye industries of England, Britain had lost the valuable aniline dye business to Germany, which was a great handicap, to paper and leather manufacturers at the present time who could not obtain aniline dyes for their products.

Some time ago the Curtis Publishing Company, of Philadelphia, Pa., publishers of the Ladies' Home Journal, entered action against the Canadian Women's Magazine Publishing Company, of Toronto, to restrain the Canadian Company from using the word "Ladies" in the "Canadian Ladies Home Journal," which name it is alleged, infringed on the Philadelphia publication. An amicable agreement has been reached between the two concerns whereby the Canadian firm will not make use of the word "Ladies." A consent judgement was granted to this effect last week.

Word received from the Pacific Coast indicates that the pulp and paper mills in that province are very busy. The Powell River Pulp and Paper Co., at Powell River, B. C., have three news print machines at work turning out about one hundred and fifty tons per day all told and a ready market is obtained for the entire output. Further extensions are being made to the plant. The British Columbia Sulphite Co., at Mill Creek, Howe Sound, is working to capacity and the Ocean Falls Pulp and Paper Company at Ocean Falls, are also operating to the full extent of the plant.

At a recent sale held by the Department of Lands and Forests, Province of Quebec, a number of permits to cut timber in the Lake St. John East district, Matepédia Valley, district of St. Laurent, district of Rimouski, Gaspé West, Bonaventure West, Lake St. John Northwest and Little Rivers limit were sold by public auction. Permits for 1,036 square miles were sold and the average price obtained was \$238 per square mile.

Pulp wood operations along the line of the Timiskaming and Northern Ontario Railway have been extensive this year and it is expected that the tonnage of spruce wood hauled to the mills by the road will be thirty per cent in excess of last year. A lot of pulp wood has been cut by the settlers who are awaiting snow before they can get it out. About one hundred and twenty-five thousand cords will be handled by the railway during the next few months. More settlers than ever are at work clearing the land and the woods force of the Abitibi Power and Paper Co. at Iroquois Falls, will take out some ninety thousand cords of pulp wood this winter.

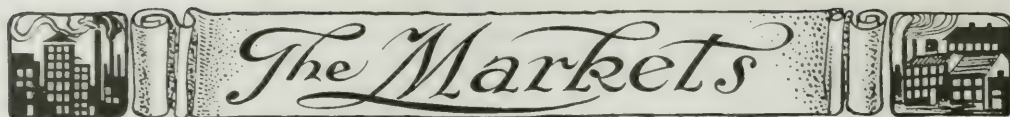
J. N. Greenshields, K. C., of Montreal, who is President of the Wayagamaek pulp and Paper Co., at Baptist Island, which concern is very busy at the present time, owing to foreign importations of kraft paper being shut off due to the war, has started a new regiment to be called the Montreal Home Guards, which are holding regular drills and becoming proficient in shooting.

The Northern Islands Pulpwood Company, Limited, with headquarters at Port Arthur, Ont., which went into liquidation some time ago, will be wound up, an order to this effect having been granted recently in Toronto by Chief Justice Falconbridge. The capital stock of the company was one hundred thousand dollars and its assets consisting of the plant and rights to cut timber on certain concessions amount to about four hundred thousand dollars. Lack of sufficient working capital is given as the cause of the financial difficulties of the firm.

Thomas Darling, who for many years was agent for J. R. Booth, of Ottawa in the northern section of Ontario, died recently at Callender. He has been in the employ of the Booth firm since 1883 and was widely known throughout the entire district.

The Toronto Board of Trade is moving into its new and handsomely fitted up home on the nineteenth and twentieth floors of the new Royal Bank building at the corner of Yonge and King Streets, Toronto. W. P. Gundy, who is managing director of the Kinleith Paper Mills and W. J. Gage and Company is president of the Board, whose quarters will be among the finest of any organization in Canada.

About twenty thousand firms in Ontario have so far filled in the circulars sent out by the Compensation Board of the Workmen's Compensation Act regarding the number of hands employed, wage bill, etc., so that the board may fix the various hazards and assessments of the different groups of industries. The operation of the new act comes into effect on January 1 next.



The Markets

CANADIAN MARKETS

The news print situation remains practically unchanged and contract consumption has been a little larger of late as more advertisements are appearing in the papers. Several leading dailies are pretty nearly back to the normal size, which they were before the war. With the advent of the holiday season and heavier advertising, it is expected that the news print demand will be larger. A number of contracts will expire at the end of the year, but it is not thought there will be any very great increase in price. Low water is still hampering a number of pulp and paper mills, but it is expected that, with the fall rains, conditions will improve.

The export business in news print for the past eight months according to the returns—up to August—show an average of \$1,091,534 per month. This compares with a monthly average of \$948,904 in 1913 and \$474,344 in 1912. In chemical and mechanical pulp there has also been a big increase of late months. The following figures for three months will show how export trade has developed.

	June.	July.	August.
News print—			
1914	\$1,135,283	\$1,149,569	\$1,108,285
1913	874,284	793,898	889,645
Mechanical pulp—			
1914	270,990	604,868	164,942
1913	173,445	251,284	276,171
Chemical pulp—			
1914	347,606	358,170	382,255
1913	121,199	218,302	203,542

There has been a slightly better demand for book papers owing to a publishing house getting out special books for the coming holiday trade, while a number of volumes and pamphlets are being published on the war, and also literature booming the "Made-in-Canada" propaganda. Writing papers are rather quiet and chiefly in requisition in the cheaper grade. No prices have been raised as yet on book, bond or writings, except in some very high class lines, but what the end of the year may show, when contracts for sulphite pulp have to be renewed, will prove interesting. The demand for ground wood is fair and a moderate amount of selling is taking place. The sulphite situation is quieter, owing to the arrival of some large shipments from Scandinavia and prices are a trifle easier.

Wrapping papers are only in fair demand, but values have been pretty well maintained. Paper box factories are active owing to the number of fancy receptacles that are being turned out for Christmas novelties and packing goods. Jobbing houses are inclined to keep stocks of paper down to a rather low amount and are cautious in the matter of placing large orders. Kraft is moving freely at a slightly advanced figure and the sale of general lines of paper has held up better than was expected for the fall. In fact, the paper trade generally has come out of the present straits, except in a few isolated cases, better than many other lines of industry.

Mixed papers are down, building papers are dull, and in the other branches of paper stock, dealers report a fair amount of business, although the volume has eased off considerably of late and speculative prices have been eliminated:—

Quotations, f.o.b. Toronto, are:—

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in carload lots.
 News (sheets), \$2.10 to \$2.20 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload), \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 4½c up.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$4.00.
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.90 to \$4.75.
 Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood pulp (at mill), \$16.50 to \$18.00.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$46 to \$47, delivered in Canada.
 Sulphite (unbleached), \$47 to \$49, delivered in United States.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$59 to \$60, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$1.95, f.o.b. Toronto.
 No. 1 soft white shavings, \$1.90.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.02½ to \$1.05.
 Heavy ledger stock, \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 90c.
 No. 1 Manila envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 30c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$6.25.
 Black overall cuttings, \$1.75.
 Thirds, blues, \$1.60.
 Black linings, \$1.75.
 New light flannels, \$5.25.
 Ordinary satinet, \$1.00.
 Flannel, \$1.10.
 Tailor rags, 90c.
 Manila rope, 3½c.
 No. 1 burrap bagging, \$1.00 to \$1.05.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, $5\frac{1}{4}$ c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to $7\frac{1}{2}$ c.
 Sulphite Bond, $6\frac{1}{2}$ c to $8\frac{1}{2}$ c.
 Writing Manilla 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper $5\frac{1}{2}$ c. to 7c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, \$3.10; 5 tons, \$3.20; 2 tons \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

Special to Pulp and Paper Magazine.

New York, November 12, 1914.

There has been a continued steady demand for mechanically ground wood pulp in the local market during the interval. Among the inquiries received by some of the large grinders were requests from pulp makers and dealers in the United States and Canada, who presumably have had some difficulty with water conditions, and as a consequence were unable to satisfy the demands of their customers. Prices were firmly maintained by all and the tendency of values is upwards. Second grade pulp has been moved in large quantities at varying prices ranging from \$12 to \$16.50 f.o.b. ground wood mill.

Sulphite was in quiet demand during the week, although importers of German grades were somewhat concerned as to future shipments. Some shipments from Scandinavia arrived in domestic ports and was promptly moved on contract request. Kraft pulp and

unbleached sulphates moved quietly on contract, but prices were fairly firm.

Much interest in the order of the German Government prohibiting the export of all grades of paper stock was shown by local importers. High grade packings of rope bagging and linens come largely from Germany and there was necessarily some feeling at the knowledge of such an order. There have been a number of fairly good-sized consignments of rags received by importers from Germany through Holland during the period immediately succeeding the outbreak of the war and prior to November 1. Rope has eased off in price, and is now quoted about $3\frac{1}{2}$ c a pound. Domestic rags are in poor demand and are inclined to be rather scarce.

While there are no accumulations of old papers in New York on account of the fire laws, there is no demand for the stock. Shipments continue steadily under fallen prices. Hard shavings are now valued at about $2\frac{3}{4}$ cents and soft about 2.10c a pound. Book stock of all grades has fallen in value about \$2 a ton. The most marked easing has been in old Manilas and mixed papers. No. 1 Manilas have been quoted as low as 70 cents a hundred and No. 2 about 40 cents hundredweight. Mixed papers are valued at about 25 cents a hundred and common paper is as low as 15 cents.

Pulp.

Ground Wood, No. 1, \$20 to \$25.50, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., $2\frac{1}{4}$ to $2\frac{1}{2}$ delivered.
 Unbleached Sulphite, impt., 2.05 to 2.25, ex dock New York.
 Bleached Sulphite, domestic, 3.35c delivered.
 Bleached Sulphite, impt., 2.85 to 3.05, ex dock, New York.
 Easy Bleaching, impt., 2.30 to 2.45 ex dock, New York.
 Unbleached sulphite, impt., 2.00 to 2.15, ex dock New York.
 Bleached sulphite, impt., 2.80c to 3.00c, ex dock, New York.
 Kraft Pulp, 2.05 to 2.15 ex dock, New York.

The demand for all grades of paper has shown an increase. Business in general is rather spotty, but there is a healthy tone to it. Collections have been in good shape, and show a still better condition at present. Mills have been fairly active during the interval in certain lines, while others reported rather quiet running. Stationers and printers reported a tendency among consumers of writings and bonds, a large falling off in the demand for high grade papers and a large increase in the demand for cheaper grades. The demand for newsprint on contract continues firm and there has been a large increase in the production of news during the past month.

Prices were firmly maintained on the few renewal orders that were taken. Sheets moved steadily at 2.35c f.o.b. New York. The wrapping paper industry reported good running and a fair volume of shipment to current values which are firm. Book manufacturers are running on nearly full time and have found a fairly active market for their goods in the interval. No change in prices was reported, but it is anticipated by many that the near future will bring some change in favor of the producers. Boards were rather quiet, but prices were firmly maintained. The demand for Manilla and kraft papers was fairly good. Bags and toilet papers enjoyed a good demand

with rather short supplies in the hands of manufacturers. There has been no change in the tissue situation which is still rather quiet as far as business is concerned. The tone is very solid, as manufacturers firmly adhere to the advanced prices now asked. Cigarette papers are rather scarce, and are in good demand. The scarcity of deep colors, such as reds, blues and purples, has brought about a scarcity of some cover papers and specialties. Prices in specialties have advanced sharply during the past few weeks.

Quotations unchanged for all grades of paper:—

Paper.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
News, rolls, contract renewals, \$2.05, f.o.b.
News, side runs, 2.25, f.o.b. New York.
News, sheets, 2.35, f.o.b. New York.
Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
Writing paper, superfine, 13 $\frac{3}{4}$ c to 17c, del. east of Miss. River.
Writing paper, extra fine, 11c del. east of the Miss. River.
Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
Writing paper, No. 2, fine, 8c del. east of the Miss. River.
Writing paper, engine sized, 4 $\frac{1}{2}$ c to 8c del. east of the Miss. River.
Bond paper, 5c to 24c, delivered east of Mississippi River.
Ledger paper, 8c to 30c, delivered east of Mississippi River.
Jinen paper, 7c to 18c, delivered east of Mississippi River.
Manilla jute, 5 $\frac{1}{4}$ c to 5 $\frac{1}{2}$ c, delivered.
Manilla, wood, 2.75 to 3.25, delivered.
Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
Boxboards, news, \$30 per ton, delivered.
Boxboards, straw, \$28 per ton, delivered.
Wood pulp board, \$42.50 per ton, delivered.
Tissue, white, cylinder, 47 $\frac{1}{2}$ c to 50c f.o.b. New York.
Tissue, fourdriner, 50c f.o.b. New York.

THE BRITISH MARKETS.

Special to Pulp and Paper Magazine.

London, November 5, 1914.

There is still a good demand for newsprint in the United Kingdom, and prices are on a lower level—about 2 cents to 3 cents. The position has been greatly relaxed owing to the continuous and substantial arrivals of wood pulps. It is stated that contracts with Canadian mills were not able to enter into, were dated at \$10.10s. about \$19.20 a ton which is not much above the price Scandinavian mills charge at present. In fine writing and printing papers there is a fair demand, but not satisfactory enough to mills producing these qualities. Colored papers, of course, are scarce. Wrapping and packing papers are in much demand, and the supply appears to be plentiful. The numerous contracts placed with the mills in September and October have not been so heavy, but there is still a good deal of paper to be turned out under existing contracts, which most of the mills are participating in. In the British printing trades, work has been revived considerably, particularly in the large establishments, and, of course, this means that a good quality of paper is being daily consumed. The German

and Austrian papers being out of the market gives the domestic manufacturers a better chance. Jobbers in German papers are at a standstill and are likely to be until peace is declared. Very little States paper is arriving here so far. The Dutch are now giving the British market some attention.

* * *

The chemical pulp market is dull after the recent brisk buying. Stocks are plentiful for the present requirements. Easy bleaching soda is scarce in the market and any paper mill that has not a good supply in is called upon to pay heavily for prompt parcels of a small quantity. Prices are near about as follows, c.i.f. British ports.

Bleached sulphite (good quality) \$64.80 to \$72.00.

Easy bleaching (No. 1) \$48.00 to \$50.00.

"News" or strong quality, \$46.00 to \$47.00.

Unbleached soda (No. 1), \$30.80 to \$31.20.

Soda kraft, \$3.80.

* * *

The ground wood market is suffering from inactivity and there is plenty of pulp on hand, large supplies have arrived from Canada and Newfoundland, in addition to the usual contract quantities from Norway. It is rumored that the Swedish mills have disposed of the French and Belgian supplies they have had to retain, owing to the war, which means that they may get good prices for any unsold pulp during the next winter. There is a good demand for dry ground wood and prices are on a higher level. Quotations in London are about as follows:—

Pine 50 per cent moist, \$9.60.

Pine, dry, \$24.00 to \$25.00.

For forward delivery quotations cannot be given. All prices are c.i.f. British ports.

* * *

Esparto is easier in prices, and supplies to hand are very fair. Rags are soaring on a higher level and the supplies are not so good owing to German, French, Belgian and other shipments being cut off. In Manchester there is no market at all for rags. Stocks of waste papers on hand with the dealers are enormous.

* * *

The demand for china clay has slackened. Other filling are plentiful. Prices all round for fillings are not so high and contracts can be fixed up on a reasonable basis for buyers.

MAINE NOTES.

Bangor, Me., November 10.—The financial difficulties of one of the large paper concerns of this country, which were recently aired in the United States District Court at Portland, Me., are interesting to paper manufacturers of both the United States and Canada.

Judge Hale of the Federal Court, has just appointed Theodore W. Law, of Portsmouth, N.H., a receiver for the affairs of the Colonial Paper Co., in response to the petition of the Old Colony Trust Co., of Boston, which instituted receivership proceedings in consequence of the alleged default of the interest payments on a bond issue of \$1,000,000 made in 1910.

The Colonial Paper Co. about five years ago absorbed the Portland Paper Co., an \$8,000,000 corporation in which many of the leading newspaper publishers of the United States were interested, for whom paper was to be manufactured at Portsmouth in one of the largest paper mills in the world. The mill was built at a heavy cost, but never turned out any product.

The company also constructed water power plants in Maine which are now idle.

It controlled about 300,000 h. p. along the Saco River which was to be extensively developed, and power in the State of New Hampshire, and possessed approximately 300,000 acres of land in Maine and New Hampshire.

The Publishers' Paper Co., by a special act of the Maine Legislature in 1905, took over the franchises and property of the Eastern Maine Timber Co., an \$8,000,000 Maine corporation, which was organized earlier that year, to assume the assets and property of the White Mountain Paper Co., a \$25,000,000 corporation for which receivers were appointed back in 1903.

PURIFYING PAPER AND PULP MILL WASTE WATER.

A means of dealing with any waste waters that offer considerable difficulties in their treatment, especially those coming from paper pulp factories, depends on the use of a mixture of hydrated silica and salts of iron and alumina prepared from ordinary clay by igniting it in a vacuum and treating the residue with such small quantities of sulphuric acid and water that the silica is obtained in a soluble form. The iron always present in common clay greatly assists the clarifying action of the soluble silica on the waste lyes, as does the sulphate of alumina also formed.

The novelty of the invention consists in the ignition of the clay (to destroy its organic matter) in a vacuum, otherwise it is difficult to get the silica in a soluble form, and the soluble silica is the main effective agent, the iron sulphate and aluminium sulphate being of secondary although considerable importance.

The details of the manufacture are as follows:—1,000 lb. of the ignited clay is treated with a mixture of 400 lb. of concentrated sulphuric acid and 1,500 lb. of water in the cold with constant stirring for about one hour. It is claimed that the product will clear one thousand times its weight of waste pulp water sufficiently in from ten to fifteen minutes to permit of its discharge into a river. The sediment is collected and re-ignited for use again.

TRADE NOTES

The Daily Courier, which is the latest venture in the field of Toronto journalism, has reduced its price from two cents to one cent per copy. It is published by the Courier Co. which has issued the Canadian Courier for some years, and is a sixteen to twenty page publication, filled with many pictures of the war and containing general telegraphic and cable news with a summary of local happenings. The Courier is a new shape, four columns wide, and its type pages are 9 $\frac{3}{4}$ inches by 12 $\frac{1}{2}$ inches.

John R. Barber, who is now in the seventy-fourth year of his age, and the dean of the paper trade in Canada, but who retired from active connection with it a little over two years ago, is to-day enjoying better health than he has for some years. It is interesting to note that of several manufacturers who assembled in the city of Hamilton forty years ago last August and formed the nucleus of the Canadian Manufacturers' Association when the National Policy was first favored, Mr. Barber is the only one living. All the others have joined the silent majority, and Mr. Barber, who in the last two or three years has twice been giv-

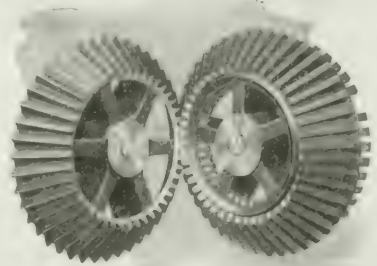
en up by his physicians, is still able to make weekly visits to Toronto from his home in Georgetown, Ont.

The Hinde & Dauch Paper Company of Canada have manufactured since the first of the year 31,300 Corrugated Bread Containers. They have installed new machinery in Toronto to manufacture Solid Fibre Board Boxes, which will be placed on the market in a few weeks. These boxes are being used by many large packing establishments and are a non-puncturing, absolutely waterproof container.

IN NORWAY.

"Farmand," Norway, says, October 24: "Those who expected a great boom in the Paper trade as a consequence of the war have been sadly disappointed. In the first days of panic, it is true, fabulous prices were asked, and in isolated cases they were also paid. But the market soon lost its anxiety as to future supplies and the tone has become more and more quiet with a gradual slowing down of business."

The demand for Moist Mechanical Wood Pulp has temporarily disappeared almost completely, mainly as a result of the big importation to U. K. on the re-opening of shipping and of the continued interruption of shipments to France and Belgium. The reports published in the daily papers on the water scarcity are simply appalling. In large districts of our country the farmers will have to cart water over long distances for the cattle, and the conditions are just as bad in Sweden. The output of mechanical pulp during the winter will therefore be greatly restricted, if heavy rains do not come soon. We are therefore still of the opinion that prices will be adjusted on a higher level than before the war.



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No. 23

The Canadian Pulp and Paper Association

The work of statistics collection which the Canadian Pulp and Paper Association is beginning, is one of the very highest importance in the industry. From the figures which will be sent in by the members, compiled by the Secretary, and issued to individuals in the form of aggregates, manufacturers will be able to form a very clear idea of the state of markets, stocks, and tendencies of shipments. It is a work which will benefit the individual and the industry alike; it will ultimately serve of immense service to the country, by indicating the most economic way in which the great part of the national resources can be handled by the nation's capitalists, laborers and Governments.

These statistical inquiries will have the effect of bringing into close communication with one another the various members of the industry, and mutual interests will be promoted. This has been thoroughly demonstrated in the American, British, Scandinavian and other pulp and paper associations. Associations and friendships are formed which lead to the very best of trade customs and to lasting benefits among the members. It has been found in the United States that the industry moves more smoothly, efficiency is increased, and that there is formed "camaraderie" which makes business life a joy.

The Canadian Pulp and Paper Association are moving to an enterprise which should form a firm basis for business for all time to come.

The Pulp and Paper Magazine would urge all manufacturers not only to join the Association, but also through it, to make unusual efforts to promote the welfare of the industry as a whole.

Business Conditions

Steady improvement may be said to characterize financial and industrial conditions in America. Canadians regard with great satisfaction recent events in the United States, which tend to loosen the money market and restore confidence. Chief among these is the opening of the twelve federal reserve banks, under the legislation not long ago adopted by Congress.

The New York and New Orleans cotton exchanges opened with unrestricted trading, and prices prevailing indicate that the crisis in the cotton situation is virtually past. Also the Savannah Board of Trade resumed trading in naval stores. The New York clearing house put into effect a change in its by-laws which released \$166,000,000 of cash reserves. In future only 18 per cent, instead of 25 per cent as formerly, of the cash reserves of its members will have to be held. Again, the curb market in New York opened for trading in unlisted stocks, and the Stock Exchange allowed free trading in municipal and state bonds of domestic account, both listed and unlisted.

War orders are pouring in from the belligerent nations, hundreds of millions of dollars for all kinds of provisions and army supplies being placed monthly. In three weeks in October, \$200,000,000 worth came in, and it is said that in one week Chicago alone received orders amounting to \$9,000,000. As the drain upon European supplies continues, there will be more and greater orders, all of which will tend to ease the financial situation in both Canada and the United States. Whatever may be the loss, which cannot help but attend all nations as a consequence of the war, America is likely to breast the storm fairly well.

The Canadian West will get a great deal of money from its crop, which, while not normal, is at least fair-

ly good, and prices, according to the recent trading are likely to reach \$1.25.

Canada's "Made-in-Canada" campaign is serving well to avoid temporary distress in the large manufacturing centres. The farmers will be comparatively well off, and the majority of what might be termed "primary industries" in the cities and towns will undoubtedly be stimulated.

There are many hard conditions still to be faced, but taken altogether the situation is favorable.

The Situation in Scandinavia

Recent reports from Norway, Sweden and Denmark indicate that the war is imposing very stern conditions upon the Scandinavian peoples. Not only has the proximity of actual naval warfare and the declaration by Britain that all the North Sea shall be a military area made trade difficult, but also the danger to vessels through mines or capture has been of late very pronounced. A great outcry was raised recently because of the detention by the British of a Norwegian ship bearing supplies of great importance to Norwegian manufacturers. Shipping in the Baltic, according to a correspondent of the London "Economist" has been much incommoded, and is, in fact, likely to be brought almost to a standstill through the action of the Germans, who have recently taken up and brought to Swinemunde a number of Scandinavian merchant steamers, principally Swedish, loaded with timber and other goods. Danish war risk insurance regulations have in consequence been made more stringent and much dissatisfaction is expressed, especially in Sweden, with the German doings. It has even been suggested that Swedish merchant vessels should have an escort of Swedish warships. Some 20 odd Danish, Norwegian and Swedish steamers are now detained at Swinemunde. The Danish-German steam ferry traffic between Gjedser and Wainemunde has again been stopped so far as the German steam ferries are concerned; traffic is now confined to those belonging to the Danish state railways.

All the Scandinavian states have had extreme difficulty in maintaining an attitude of neutrality. Newspapers divide their front pages exactly in two, and give one side to the Allies' reports, the other side to those of the Germans. Sections of both British and German peoples have made charges of partiality, against the Scandinavian states. A refutation of some of these charges, made to the London "Economist" by the Secretary of the Swedish Chamber of Commerce in London serves to show the nature of the Scandinavian neutrality troubles; and at the same time is of exceptional interest to pulp and paper manufacturers in exhibiting the shortage of supplies entering into the manufacture of pulp and paper.

In regard to coal this official says. The importation into Sweden from the beginning of the year up to the

end of July, 1914, shows a shortage of 315,000 tons, compared with the corresponding period of the previous year. The imports during August last were 125,800 tons less than in August, 1913. Further, Sweden has in recent years imported considerable quantities of coal from Germany. These shipments were largely prevented during August and September, and so great was the want of coal in Sweden that the city of Stockholm and some other towns were compelled to reduce street lighting at the outbreak of the war, and many industries were in danger of being entirely stopped. When, besides, it is borne in mind that numerous industrial establishments, usually dependent on water power, were to a very great extent deprived of this source of power by the exceptionally dry weather during the spring and summer, and consequently had to fall back on coal, the absurdity of the alleged re-exportation of coal must be clear. As early as on August 2nd, on these grounds alone, the Swedish Government prohibited the exportation of coal, and have similarly forbidden the exportation of petrol."

The difficulty of obtaining sulphur is still pronounced. Stocks of cellulose are getting very low—much lower than at this time last year. This applies to sulphate also. On account of the large sales for prompt delivery which have been made during the war, the unsold quantity for delivery during the present year is also very small.

The water troubles, which have reached such an acute stage as to make it necessary for farmers to draw water for miles for their live stock, point to an unprecedented water shortage during the coming winter if present conditions hold for even a few weeks longer.

These conditions are of especial interest in America, where numerous factors have combined to place the pulp market in an entirely unusual position.

Before the winter is out we may expect some very peculiar tendencies, and if the wood shortage should be as acute in Scandinavia, as it would appear it may easily be, Canadians may be able to perform an unusual service to the pulp-consuming centres of the world.

CLEANING UP THE WOODS.

The intention expressed by Hon. W. H. Hearst, Minister of Lands, Forests and Mines in the Province of Ontario, that the embargo on the dying and down timber in the northern parts of the province will be raised shortly should be received with satisfaction in all quarters. The policy should have the effect of cleaning up many areas which would otherwise be nothing but fire traps.

It is expressly stated that this projected move on the part of the Ontario Government does not compromise in any way its well-known attitude on the pulp-wood exportation question.

CANADIAN PULP AND PAPER ASSOCIATION TO COLLECT STATISTICS

PRESIDENT RIORDON'S STATEMENT.

To Canadian Manufacturers of Pulp and Paper:

The Canadian Pulp & Paper Association has started the gathering of frequent statistics with regard to distribution of product, having achieved the first step that it undertook of obtaining a mem-



CARL RIORDON,
President of the Association.

bership representing considerably more than half the tonnage of pulp and paper made in the country.

It proposes to provide its members with a knowledge of their markets sufficient to enable them to direct their policies intelligently.

This is only one line of activity of many in its field which it will undertake one by one as it gets each one well organized.

It seems certain that it will be of great value to all its members, and I earnestly urge all manufacturers of paper who have not already done so to join the Association, not only to receive the benefit of its work, but to help to make that work better.

At a meeting of the Executive of the Canadian Pulp and Paper Association held in Montreal, November 18th, plans were laid for activities which will bring the Association into its full sphere of usefulness to the industry. The meeting was called principally to receive the report of a special committee on statistics, composed of Messrs. Carl Riordon (convenor), J. H. A. Aeer, A. G. Campion, and C. Howard Smith, which had been constituted at the previous meeting of the Executive. The Committee reported that, following several months of quiet steady progress, during which time several members had been added and the financial status of the Association considerably improved, the time now appeared opportune for the establishment of the work of statistics collection.

The committee had every assurance that the work would prove entirely successful, and recommended that no time be lost in advancing this most important part of the Association's activities.

The committee felt that the successful collection of statistics of production, shipments, stocks on hand and commitments in one or two classes of product would have the greatest influence in securing the co-operation of all mills in all other classes. The most promising division were therefore singled out for a beginning, and as time goes on, the others should be taken up.

As Mr. H. T. Meldrum, the Secretary-Treasurer of the Association, has been finding it impossible to undertake the work of the office in conjunction with



I. H. WELDON,
Vice-President.

his pressing duties as Montreal Secretary of the Canadian Manufacturers' Association, the appointment of a new secretary was recommended. The Executive has chosen Mr. Roy L. Campbell, Editor of the Pulp and Paper Magazine, to succeed Mr. Meldrum.

The Executive, through the President and Secretary, have already sent out blanks to secure from cer-

the divisions a statement of production, shipments, etc., in November.

The blanks are to be filled out and returned to the Secretary immediately after the first of December. It is expected that on the day on which the last form is received from the contributing members the aggregate statistics will be made up and sent out. In this way members will be apprised of the actual volume of business.

It is confidently expected that at least one other division of manufacturers will be ready to make statistical returns in December.

These sections and the chairmen at present, are:—

Writing—C. Howard Smith.

Book—F. H. Gage.

News—G. M. McKee.

Miscellaneous—G. H. Millen.

Coated Papers—F. A. Ritchie.

Chemical Pulp—T. J. Stevenson.

Ground Wood—K. L. Warren.



J. H. A. ACER.

Member Statistical Sub-Committee.

No statistics will be compiled for any class of information to which fewer than three mills contribute. In this way, individual reports will be assured.

All figures are strictly confidential between the individual firm and the Secretary. No other person will have access to them.

No firm will receive aggregate statistics in any class of information to which it does not contribute.

As time goes on it is hoped and expected that the scope of the inquiry will be extended, until every point on which the members are willing to give and receive information will be included in the blank forms.

To those who have not yet joined the Association the Executive is sending out hearty invitations to become identified with the organization and to participate in the statistical enquiries.

As the body grows, other questions will be taken up, such as meteorological conditions, railway problems, tariff, and technical investigations.

It is expected that co-operation to the extent at least of exchanging aggregate statistics will be entered into



C. HOWARD SMITH.

Member Statistical Sub-Committee.

with the American Paper and Pulp Association, with whose officers the Canadian Association has already been in communication.

Altogether, the outlook for the success of the Association is most bright. The work of the past year, while quiet, has been conducive to firmness and thoroughness, and it is believed that the measures which the officers who held office in the Association at its inception about two years ago advocated, will now have an excellent chance of obtaining completion. The membership has increased in the last few weeks, and applications are now coming in. Members to date are:



ROY L. CAMPBELL.

Secretary Treasurer.

Albion Power & Paper Co., Ltd., Montreal.

Barber Paper & Coating Co., Ltd., Georgetown, Ont.

The Beaver Companies, Thorold, Ont.

Belgo-Canadian Pulp & Paper Co., Ltd., Shawinigan Falls, Que.

F. W. Ford & Son, East Walpole, Mass.

J. R. Booth, Ottawa, Ont.
 Chicoutimi Pulp Co., Chicoutimi, Que.
 Donnacona Paper Co., Ltd., Quebec, Que.
 The E. B. Eddy Co., Ltd., Hull, Que.
 J. Ford & Co., Portneuf Station, Que.
 The Interlake Tissue Mills, Ltd., Toronto, Ont.
 Kinleith Paper Co., Ltd., Toronto.
 Laurentide Co., Ltd., Montreal.
 Jas. MacLaren Co., Ltd., Buckingham, Que.
 MacLeod Pulp Co., Ltd., Liverpool, N.S.
 The National Paper Co., Montreal.
 Ed. Partington Pulp & Paper Co., Ltd., St. John, N.B.
 Powell River Co., Ltd., Powell River, B.C.

Ottawa Notes

Ottawa, Ont., November 25.—Supreme Court of Canada will shortly give judgment in a case of interest to the pulp and paper world, that of the Chicoutimi Pulp Company against Col. William Price, of Price Brothers, Quebec, lately noted as the man who made all the arrangements for the preparation of Valcartier camp, and the departure of the first Canadian overseas contingent. The Chicoutimi Company sued Col. Price for libel and asked a verdict of \$25,000. It was claimed that in 1904 Col. Price had written to the Montreal Gazette and other newspapers alleging that the Chicoutimi Company had influenced the Quebec Legislature to obtain the lease of limits in the province. When the case first came to trial in the Superior Court of Quebec, the action was dismissed, but on an appeal being taken to the Court of King's Bench a verdict was given for the company. Col. Price then appealed to the Supreme Court, which has reserved judgment.

At a meeting of the Railway Commission held in Ottawa a week ago, an application by the Riordon Pulp and Paper Company in the matter of Canadian Northern Railway rates was to have been heard, but was postponed. The company is complaining against increased rates on wood pulp and sulphite from Merrittton and Thorold, Ont., to points in the United States, made effective on November 16, by a supplementary tariff issued by the railway.

The only pulp and paper incorporation at Ottawa during the last two weeks has been that of the Sandwich Bay Pulp and Lumber Company, Ltd. The incorporation is a rather important one, the capitalization being two millions. The company seeks power to take over timber lands in Sandwich Bay, Labrador and Newfoundland where it will carry on a general pulp and paper and lumber business. It also seeks authority to engage in fur trading. The incorporators are all Montreal brokers, Messrs. Aurele, Lucien and Arthur Bernier, George Etienne DeSeve and Oscar Beauchamp.

Extensive construction work is proceeding at the J. R. Booth plant. A new steel and concrete timber mill is being constructed to replace the one destroyed by fire some months ago. This is noteworthy as the only building of its kind which the Booth firm has let by contract. The Dominion Bridge Company is putting it up, whereas it has always been the custom of Mr. J. R. Booth to do work of this kind by day labor under his own personal supervision. He is now carrying on extensive dam and flume work in this manner, the letting of the timber mill contract having been due to his indisposition consequent on the accident which he sustained at the plant some months ago. This has been a fairly busy year at the Booth plant as a result of accidents, fires and new construction, a new sulphite mill having been built as an addition to the present mill.

While pulp and paper firms on the Ottawa are still operating all the lumber mills have now closed down, the W. C. Edwards firm being the last to do so. Both the E. B. Eddy and J. R. Booth firms are operating more or less under difficulties, as, on account of the low water in the Ottawa, they have to shut down their plants at night to allow the City of Ottawa to obtain sufficient head for fire pressure purposes.

MAC.



H. T. MELDRUM.
 Retiring Secretary-Treasurer.

Riordon Pulp & Paper Co., Ltd., Montreal.
 Ritchie & Ramsay, Ltd., Toronto.
 Riviere du Loup Pulp & Paper Co., Ltd., Fraserville, Que.
 Howard Smith Paper Mills, Ltd., Montreal.
 Spanish River Pulp & Paper Mills, Ltd., Toronto.
 St. Lawrence Paper Mills Co., Ltd., Toronto.
 Toronto Paper Mfg. Co., Ltd., Cornwall, Ont.
 Union Bag & Paper Co., New York.
 Wayagamack Pulp & Paper Co., Ltd.

APPEAL ON INTERSWITCHING RATES.

At the hearing last week the claim was made by representatives of the Canadian Manufacturers' Association, the Canadian Lumbermen's Association and others, that inter-switching rates in Canada were higher than those in the United States, from \$8 to \$12 per car in Toronto and Montreal, they asserted, as compared with an average of from \$5 to \$9 in the United States cities. The case was finally adjourned to come up again in a few days.

VALUE OF STATISTICS OR OF ACCUMULATED EXPERIENCE TABULATED

By E. S. MACPHAIL,
Census Branch, Dept. Agriculture, Ottawa.

Statistics may be said to be to a nation what book-keeping is to an individual and may be divided into two main divisions—administrative and scientific. Under the head of the former may be included the census, the chief purpose of which is demographical, that is, to supply information as to the numbers and local distribution of the population, the numbers of each sex by age, civil condition, origin, nationality, nativity, occupations, education, etc. This is the minimum of information required for national administrative purposes. Governments also gather statistics of trade and facilitate the collection of revenue. They collect statistics of crime in the ordinary course of judicial procedure and vital statistics are collected to aid in preventing crime, to facilitate the transference of property and to make the foundations of social life secure. The statistics of agriculture, manufactures, mining, etc. are collected to enable the government to gauge the progress of these industries, to enable it to intelligently lend a fostering hand, where it is shown that such help can be given without paternalism and where it may act as near a stimulus to greater extension and more intelligent operations.

Statistics provide methods for the scientific sifting of the accuracy of statements, for measuring the significance of differences, for comparing the results obtained under similar conditions in one country or province with those obtained in another, and the expression and analysis of the differential relationships. In short the science of statistics is the chief instrumentality through which the progress of civilization is now measured and through which its development hereafter will be largely controlled. In the words of the Hon. S. N. D. North, late Director of the U. S. A. Census, "In the last analysis the science of statistics is the chief instrumentality upon which the world now depends in its efforts to advance the movement which is at ferment in every civilized land."

Statistics enable the student of events, whether national or of a particular industry, to grasp the why and the wherefore of the stagnation, retrogression or advancement of the country as a whole, or in any of its component parts, or of any industry or of the various factors the aggregate results, which we are pleased to term either the success or failure of the policies pursued. And unless we have reliable statistics bearing on these subjects we may be wittingly or unwittingly led to wrong conclusions. Mark Twain said that "There were two ways of deceiving our fellow-men—one by perjury, the other by statistics." Again quoting Dr. North "All great subjects of modern legislation depend for their intelligent handling upon the accuracy and completeness with which the facts have been statistically developed. Our civilization has grown so complex, so sensitive in its manifestations and reactions that it would cease to operate effectively if it were deprived of accurate, systematic, money, of production and consumption in all lines of industry.....

Augustus G. Webb in his preface to the complement of Mullhalls New Dictionary of Statistics says "Statistical comparisons are always treacherous unless the things are adequately defined." He also says "It is perhaps not too much to say that the statistics of any country cannot be unreservedly compared with those of another dealing ostensibly with the same subject."

Bearing in mind these limitations which are more or less true of all classes of statistics and the fact that in a paper of ten or fifteen minutes duration we cannot more than state as briefly as may be the value of statistics as they stand in relationship to the establishment and probable subsequent success of an industry or as an indication of demographical or commercial development. In weighing the results obtained by a particular industry in a certain locality or country with a view of castings a horoscope of the probabilities of success of a similar venture in another or same location certain conditions must be carefully studied. The means for such a study can be supplied only by statistics, which are likely to be compilations and tabulations of returns obtained through the census or through the efforts of a particular group of industries whose managers are alive to the situation and realize the value of statistics.

In establishing a new industry a matter of the first necessity is to know the conditions under which a similar industry was or is a success or failure in another community and apply those conclusions statistically digested, to the venture in hand. To this end the captain of industry must have reliable statistics, giving (1) the character and composition of the population in the locality where it is destined to establish there is not likely to be an opening for the trade in which he is particularly interested. Paper is needed and used everywhere. True, but to produce it profitably and carry on the industry intelligently, the manufacturer must decide beforehand for what market he is going to trim his sails, so as not to be guilty of carrying coals to Newcastle. For example, a boot and shoe manufacturer could not expect to sell as many ladies boots as men's in Vancouver whose population is 60 per cent male, or in Calgary where males constitute 61 per cent of the population or in Regina where there are only 34 females to every 66 men.

The statistics of population, of exports, imports and production, of foreign countries will enable us to tell where there may be profitable openings for our surplus production. It is not meant that such expansion cannot be made without statistics, but it is maintained that it cannot be as intelligently made, that is to say, it is only when the same peculiarities are possessed by many persons that they become of importance, or as it is stated by Arthur L. Bowley in his "Elements of Statistics," "The object of a statistical estimate of a complete group is to present an outline which will enable the mind to comprehend with a single effort the significance of the whole." It must be remembered that it is impossible to follow or measure the motions of several atoms, that it is of small consequence to the forward movement of a nation whether any one

concern is snuffed out or shines. It is only when we begin to deal with aggregates and effect comparisons, which can only be accurately made on statistical basis, the plant and also of the place which is taken as the medium of comparison, (2) percentage of population native born or immigrant and also the country of birth of the latter, (3) the relative standing of the population male and female by ages, so as to be able to form a fairly accurate estimate of the probable supply of effective labour, (4) the educational standing of the community from which the labor is to be obtained—an illiterate community cannot supply as efficient employees for any, but the roughest kind of work, as can be supplied by a community the members of which have a working education. It is of small value for a comprehensive survey of the labour conditions which are likely to tend to the successful operation of an industry to know that in a certain locality there are some desirable people, the thing of value is, to know by aggregates which extend over successive periods whether the movement in population be forward or backward, or whether it be stagnant. It is only by such a method that an intelligent forecast of the kind of class and fixity of the labour supply can be determined. Such a review will give an idea of the probable cost of production, the kind and class of article which ought to be manufactured in such and such a community.

Statistics of population are of value to the producer as a means of determining where to push the sale of his goods. Every manufacturer should be a close student of the statistics of population not only of his own country but in every country where there is and where that sane conclusions are arrived at.

A study of statistics enlarges the individual experience. You and I are limited to what we see; our knowledge is extended by various means—such as newspaper reports and the writing of experts and our thinking is apt to be biased by the peculiarities of our position. As soon as you and I commence to examine the various view points of our researches then we are conducting a statistical investigation, and as every man cannot be master of all trades hence the necessity of the statistician and statistical methods. Again quoting from the same author "A chief practical use of statistics is to show the relative importance—the very thing which an individual is likely to misjudge. The absolute magnitude of a quantity is of little meaning to us till we have some similar quantity with which to compare it." Those of us who have to handle figures, whether they be the statistics of a nation or those of a particular class of industries know that in the case of most statistics we need some means of comparison before we can appreciate the meaning of the questions in hand. For example the statistics of the first years of the operations of paper and pulp mills and of each successive year are necessary to ascertain to what extent the industry is progressing and as to whether its advancement has kept pace with the growth of population, particularly of the educated. It is only by a careful analysis of the statistics of the past that the evolution of the industry can be scientifically and truly weighed and reliable data secured to guide future developments. The output of a single pulp and paper mill is of little consequence to the general welfare of the industry as a whole. In other words it is only when the products of all pulp and paper mills are taken together in such a way as to be comparable with the results of previous years and with the results attained by mills similarly equipped in other countries that the value of their statistics become apparent and

useful. To do this intelligently it is necessary to have statistics of population, transportation, of labour conditions, wages and of the general economic conditions at each point of manufacture and distribution. Hence the value of statistics in arriving at safe conclusions as to the probable success or failure of an industry as carried on under certain conditions. There is absolutely no doubt that the consumption of paper is on the increase, but such a statement may be termed as a bold assertion unless backed up by statistics. The comparative tables given later on amply proves this. It is the business of the Government statistician to collect, arrange and describe such information as is necessary to the proper conduct of questions of administration, but to draw no deductions, it is his business to present evidence but not conclusions. These limitations should not be applied to the work of the statistician of an association. In the preparation of his statistical data he should not only collect, arrange and describe all the possible information relative to the sources of supply of raw material, their extent, and availability by specified areas in the whole country, the probable estimated requirements of the country for from ten to twenty years hence, as indicated by the trend of immigration, natural increase in population, the rise and development of cities and towns, but by a scientific analysis and weighing of such data determine with accuracy and precision the results which may be expected from future operations under given normal conditions. In other words, it is his duty, after having made a careful and accurate survey, to draw deductions and present conclusions and having done so to have faith in them and to preach them.

There is no doubt in my mind, that as commercial statistics have revolutionized commerce, so industrial statistics carefully collected, compiled, tabulated and scientifically analysed and applied would materially benefit the manufacturing industries. This morning's papers supplied us with quotations not only as to the prices of stocks and bonds but also of the supply of wool, cotton and foodstuffs immediately available for human consumption or in warehouses, elevators or afloat. Why should there not be as good information available regarding the supplies and probable requirements of any of the manufactured products? It may be available but I am not aware of it.

The annual reports of our great business organisations should be as fully presented and be as trustworthy and impartial as a Government report. Only such reports can be useful to the producers themselves. The industrial statistician could deal, as the Census Office cannot, shall I say, dare not, with the wage problem of the day-rate, the weekly rate, the piece rate, which are often utilised in the same mill, and thus determine the factors which tend to show the average number of employees in each industry, the average earnings and the actual relative share of employer and employee in the increment of the industry.

Few of us are capable of thinking in the high numbers but we can all readily comprehend such figures when presented in relative and comparative percentages.

Until such time as the Federal Government will undertake to collect, tabulate and publish annual statistics of manufactures, the various associations should have for their own use at least such data readily at hand. It is only by such means that it can be known with any degree of accuracy the quantity and value of articles produced, the aggregate and average wages paid, the total production and the quantity of it

distributed, the relationship which the cost of raw material bears to the cost of manufacture as represented by the cost of plant, visible working capital, cost of labor and transportation.

Census statistics as presented in the twenty tables in the volumes of the Census dealing with Manufactures gives, I think, as fully as such statistics should the various facts relating to the different industries. The aim of census statistics where many phases of national stocktaking are dealt with is to present general results. But in addition to the information concerning capital, employees whether inside or outside workers, day or piece workers, fuel, cost of raw materials, etc., there should be available information regarding the cost of distribution, extent of depreciation, renewal charges, interest charges, etc., before it can reasonably be demonstrated whether the industry is making abnormal profits or only such a net profit as every individual or corporation should derive from ventures which depend on the fluctuations of the commercial barometer, that is to say, a fair average percentage

over and above the current interest obtained from stable investments such as consols or gold bonds. We all admit we ought to have these statistics, it is not always so easy to obtain them. Then we should have the statistics relative to ages of the employed, their social habits in regard to temperance, etc. We may as well own up to it we have deliberately created industrial and social conditions which make the living wage a burning issue, and one which will require skilful handling so as not to, while giving the employee his dues, real or imaginary, cripple the employer to such an extent that he may find it more to his advantage to close his works or curtail his output than submit to undue exactions and thus create a condition and produce a result which, instead of removing a grievance will react disastrously in a greater or lesser degree to both parties. But there is no need of anticipating any dire consequences for statistics have appeared on the scene and in unequivocal terms show where the basis of compromise is to be found and lead all parties into the "via media" of equity.

PAPER AND PULP MANUFACTURERS CENSUS, 1911 AND 1901

	No.	Capital. \$	Wages. \$	Materials. \$	Product. \$
Pulp and Paper 1911	79	54,718,415	5,162,150	11,125,794	23,732,556
Pulp and Paper 1901	56	19,301,919	2,405,150	3,711,764	8,774,647
Increase Total	23	35,416,496	2,756,884	7,414,030	14,957,909
Increase p. c. . . . .	..	183.48	114.61	199.74	170.46
Av'ge per establishment 1911	..	692,638	65,344	140,833	300,412
Av'ge per establishment 1901	..	344,676	42,952	66,281	156,590
Card Board 1911	7	831,482	104,143	251,607	506,077
Card Board 1901	3	235,540	34,461	73,907	147,000
Increase Total	7	15,596,741	69,682	177,700	359,077
Increase p. c. . . . .	..	253.01	202.20	240.43	244.27
Av'ge per establishment 1911	..	118,783	14,878	35,944	72,297
Av'ge per establishment 1901	..	78,513	11,487	24,636	49,000
Paper 1911	35	23,104,560	2,895,717	6,510,886	14,109,014
Paper 1901	28	7,507,819	1,191,038	2,170,770	4,380,776
Increase Total . . . . .	..	15,596,741	1,704,679	4,340,116	9,728,238
Increase p. c. . . . .	..	207.73	143.12	199.93	222.06
Av'ge per establishment 1911	..	660,130	82,735	186,025	403,114
Av'ge per establishment 1901	..	268,136	22,537	77,528	159,313
Wood Pulp 1911	37	30,782,373	2,162,290	4,363,301	9,117,465
(All processes) 1901	25	11,558,560	1,179,807	1,464,087	4,246,871
Increase Total	12	19,223,813	892,483	2,899,214	4,870,594
Increase p. c. . . . .	..	166.31	83.27	198.02	114.68
Av'ge per establishment 1911	..	831,956	58,440	117,927	246,417
Av'ge per establishment 1901	..	462,342	45,192	58,563	169,875

This table, limited in scope and presentation of facts as it may be, yet indicates that the paper and pulp manufacturers are in a healthy progressive state. In 1901 a population of 5,371,315 made it possible to produce \$8,774,647 worth of paper and pulp, while in 1911 for a population of 7,206,643 the production aggregated \$23,732,556. The gain in population in the decade was 13.36 per cent and in pulp and paper production 170.46 per cent. What has made possible such phenomenal expansion? If the increased population had used paper and pulp only in the same ratio in 1911 as it did in 1901 the value of the product required would only reach 12 million dollars, or if we make out payment to paper only 6 million dollars' worth instead of 14 millions it could have sufficed. Statistics furnish the key to the solution of the question by

the presentation of evidence regarding not only increase in population, better education, migration, improved social conditions made possible by higher wages. These all contributed to the result and enable us to make a comprehensive survey of all conditions which made possible such an expansion, and from statistical premises to determine logically, that is to say in terms of figures to what an extent further development is warranted.

The table also enables us to see at a glance that cost of labor and materials have increased in about the same proportion as has the value of production. The cost of labor alone increased by \$22,392 per plant or 52 per cent from 1901 to 1911. The average wages per person of the 6,361 persons in 1901 employed in the production of pulp and paper was \$378 as com-

pared with an average wage of \$517 for 9,996 persons in 1911. A further deduction from these statistics is, that the net proceeds for the whole industry (excluding depreciation of plant, renewal charges, etc.) was 13.6 per cent in 1911 and 13.7 per cent in 1901.

Statistics enable the manager to satisfy his shareholders that things are well conducted. It may be said, that dividends will do this. I have known excellent returns to reach shareholders from the sale of bonds or by the sale of a block of reserve stock. Bare, cold, unbending statistics alone will demonstrate whether the industrial craft ought to be beached to prevent a wreck in mid-ocean or whether she is fitted to weather the gales to the haven of success. Statistics enable the nation, in a larger and more comprehensive manner than is perhaps possible in smaller affairs, to take stock and plan for the future. It is, I think, an

undeniable fact, the British statesman to the contrary notwithstanding, who declared that "There were lies, damn lies, and statistics," that by figures only can the true financial, commercial and social conditions be expressed in unbiased terms. Figures are truthful things and ought to be so handled.

But great as has been the progress of production in the pulp and paper industry between 1901 and 1911, statistics show us that the progress, although excellent did not keep pace with demands. In 1909 we imported paper and paper goods to the value of \$3,581,807, in 1910 the value was \$4,580,282, in 1911 it reached \$5,454,910, in 1912 like Bruce's spider, it climbed higher still, reaching \$6,259,896, while in 1913, emulating, no doubt, the high cost of living it scaled the height of \$8,194,025.

Value of Paper, all Kinds, Imported Into Canada From All Countries During the Five Fiscal Years Ended March 31st, 1909-1913.

	1909. \$	1910. \$	1911. \$	1912. \$	1913. \$
Albumenized and other papers and films chemically prepared for photographers' use	102,508	134,558	159,204	201,665	204,921
Bags of sacks printed or not	26,379	28,493	29,171	55,725	52,225
Cards for playing	64,842	78,204	83,344	109,575	129,838
Card board not pasted or coated	20,992	26,877	42,447	70,045	82,066
Envelopes	56,837	79,245	84,573	91,268	117,080
Felt board	40,533	8,907	7,205	7,122	11,700
Hangings of wall paper, including borders	217,158	274,991	313,051	343,100	467,759
Leather board, leatheroid and manufactures of	20,536	32,777	26,930	47,521	50,915
Mill board not coated or pasted	50,872	49,098	74,645	58,739	100,009
Union collar cloth paper in rolls or sheets, glossed, finished or not	1,571	2,532	2,029	1,042	1,837
Pads not printed, papier mache ware . .	7,884	6,225	2,718	10,542	8,468
Paper, manufactures of, not otherwise provided for	1,051,424	1,327,799	1,569,087	1,821,936	2,482,760
Paper matting when for use in Canadian manufactures . . . . .	.....	.....	.....	.....	890
Patterns, boot and shoe, manufactures of paper	6,455	2,599	9,730	23,051	15,163
Printing paper (for newspapers) in sheets or rolls valued at not more than 2 1/4 cents per pound . . . . .	.....	41	56,486	146,258	152,160
Printing paper not otherwise provided for	374,502	462,212	631,810	616,372	644,131
Ruled and border and coated papers, boxed papers and papereries	100,381	168,567	221,402	300,161	328,777
Straw board not pasted or coated	25,238	28,744	54,669	61,221	108,271
Tarred and other building papers, not otherwise provided for	294,664	345,795	396,083	470,944	687,577
Window blinds of paper of all kinds . .	.....	115	593	194	505
Wrapping paper	77,666	88,453	96,247	138,958	221,746
All other kinds	1,041,365	1,434,050	1,605,486	1,684,456	2,325,227
Totals	3,581,807	4,580,282	5,454,910	6,259,896	8,194,025

Our exports of paper were, in 1908, \$3,503,298, \$3,469,713 in 1909; \$3,156,096 in 1910; \$3,912,196 in 1911; \$3,867,119 in 1912, and \$6,324,810 in 1913. Having the labor, the natural resources, and accessible markets, why we need to import so heavily is a question for statistical investigation. I am aware that there are other factors which control the movements of trade, such as the supply of raw material, cheap power, proximity of markets and their capacity. All of which, to be

convincingly and intelligently comprehensive, must be expressed in figures.

To summarise. Statistics are the only means by which we may determine the movement of population from the country to the city or from one part of the country to another, the extent of immigration and emigration. They enable us to ascertain with precision and accuracy the social conditions of the people as evidenced by the percentage of illiterates to the

total population and as to whether there is an upward trend as shown by comparative statistics of school attendance extending over a period of years. Statistics of education and naturalization are particularly useful in determining to what extent the foreign born may be considered a constant factor in the future development of the country—the first is valuable as showing whether the children of the immigrants are attending school and being fitted for the duties of citizenship, and the latter whether the immigrants of voting age are assuming the responsibilities of citizenship, or are simply leeches on the body politic. It may be said that they give labor for money. What we want in Canada is a stable educated population, not wayfarers.

Statistics of wages and earnings enable us to comprehend the purchasing power of the people and knowing their improved financial status cater to that prosperity with a better class of goods. The quality of newspaper used is evidence of culture.

Statistics of transportation indicate the strength of

the currents of trade and also the relative development of land and water transportation facilities.

In agriculture they show whether the possibility of adequate supply of food for man and beast is being maintained and whether under present conditions the proportion of production to consumption is likely to be sufficient for the needs of the future increased population.

To the manufacturer a knowledge not only of administrative statistics but also of scientific statistical research is necessary. He must take into account the past and present conditions of population, agriculture, transportation, and by a comprehensive survey of the whole as presented in a concrete form learn the lessons which they teach regarding the prospects of future developments and the bearing which they have on the problem of raw supply, manufacture and distribution. In the words of Levesseur "statistics illumine the footsteps of the future by an exact knowledge of the past," and to that end I would ask your hearty co-operation in the work of collecting Census Statistics.

THE RELATIONSHIP OF MOISTURE AND PAPER

By E. SUTERMEISTER.

(Written Specially for Pulp and Paper Magazine.)

The interrelation of moisture, paper, and atmospheric humidity has never been given sufficient attention in the paper industry in spite of the fact that it is of vital importance to every manufacturer and user of this product and in spite of the fact that lack of attention to this matter is the cause of many a failure in the press-room. In this paper it is proposed to discuss a few of the more important ways in which moisture affects paper and to show how great is the importance of considering such problems, both to the paper maker and to the printer.

Previous Investigations.

It is a well known fact that paper contains more moisture in a humid atmosphere than in a dry one. On a damp day it feels limp and rag-like, while in dry weather it has snap and rattle, the difference being entirely due to the difference in its moisture content. The extent of such variations was shown a number of years ago by Prof. Dalen who published the results of moisture determinations on fourteen papers at relative humidities varying from 30 to 100 per cent. It is unnecessary to quote his results in full, but it may be stated that at 30 per cent humidity the papers contained 2.3 per cent to 4.6 per cent of moisture while at 100 per cent humidity they contained from 10.2 per cent to 15.1 per cent. The papers which he examined included writing, printing, wrapping, hand-made and Japanese papers and the fibrous stock and spring varied widely enough so that the collection may be considered fairly representative of the whole field of paper products, with the possible exception of coated papers. Recent tests by the author on a number of book, offset, and coated papers, show at a general run a fair degree of conformity with Prof. Dalen's results though there seems to be a tendency for coated papers, particularly those containing water waste, to retain more moisture than uncoated papers.

Very recently von Roessler published the results of moisture determinations in a large number of pa-

per half-stuffs at relative humidities ranging from 10 per cent to 90 per cent. Up to 60 per cent humidity practically all of these contain more moisture than the papers tested by Prof. Dalen, but beyond that point the moisture in the paper increases much more rapidly than that in the half-stuffs. Von Roessler's results show that the moisture content varies very nearly in proportion to the relative humidity, but that different materials retain different amounts of moisture.

Importance to Manufacturers.

The relation of these results to actual manufacturing operations may be seen when a few moisture tests on actual mill products are considered.

	Moisture.
Antique paper taken from roll contains.	3.3-4.1%
Super paper before calendering contains.	3.7-6.7%
Super paper after calendering contains.	2.7-4.2%
Coated paper after calendering contains.	2.8-3.0%
Coated paper uncalendered contains . . .	4.4-8.1%
Miscellaneous papers of unknown grade contain when ready to ship	2.7-4.7%

These papers not only show wide variations, but many of them, when compared with Prof. Dalen's averages, will be seen to contain considerably less moisture than they should unless the atmospheric humidity is assumed to be as low as 30-40 per cent.

To see how the humidity varied in a manufacturing establishment having a fair system of ventilation, but no means of controlling the humidity, observations were taken at frequent intervals during a period of eighteen months. The hygrometer used was of the wet and dry bulb type so placed that it should be subjected to a good circulation of air at all times. These records showed that the relative humidity varied from 30.5 to 70.9 per cent and averaged about 52 per cent. During this period the maximum observed change in humidity from one day to the next was 26 per cent, and within a space of two days 30 per cent. Undoubtedly greater daily variations than this are occasionally

met with, and must be reckoned on in calculating the advantages to be gained in controlling the humidity.

Considering now a paper which leaves the paper machine with a moisture content of about 4.5 per cent; on super-calendering this will be still further dried out, probably down to about 3.0 per cent moisture, and if it goes through the winding, cutting or sorting process and is packed on a very dry day it will probably leave the mill with very little over 3 per cent of moisture. In a part of the same order there may be a roll which left the machine with 6 per cent of moisture and by being handled on a damp day reached the end of the process with fully 5 per cent remaining. These two rolls certainly could not be expected to work the same in the press-room and the chances are that such variations in moisture on leaving the machine would cause other variations in the finished product which would be more serious than the actual difference in moisture.

If paper is too dry when it leaves the machine it is brittle and apt to break on calendering and it does not readily take a high finish. If on the other hand the paper is insufficiently dried on the machine it is apt to crush and blacken on the super-calenders, while at the same time, taking a higher finish than is desired. Between these two extremes lies the middle path which it is desired to follow, and the following of which is usually left to the skill and care of the machine tender. He may be the most painstaking man in the world, and yet there will be times when paper which is too dry or too moist will get by him and cause trouble further down the line. Obviously a practical method of controlling the drying of paper so as to keep its moisture content uniform at any given point is much to be desired. This has been attempted by various devices to regulate the steam entering the driers according to the tension of the paper, which is dependent on its dryness. Other apparatus has been designed to accomplish the same result by keeping the temperature of the driers at a constant point. Either of these methods is distinct improvement over the old idea of hand regulation, but it is confidently predicted that still better methods can be devised.

Even if paper could be turned off from the machine with a perfectly uniform amount of moisture, it does not necessarily mean that it would be in equilibrium with atmospheric conditions at the time it is shipped, for it is frequently sent out very soon after super-calendering and before it has had a chance to take up its normal amount of moisture. If very dry paper is shipped in rolls the absorption of moisture may make it expand sufficiently to cause wrinkles or in very bad cases, the rolls may even burst, while if cut in sheets and cased the paper is likely to wrinkle and cockle through uneven absorption of moisture with consequent trouble to the pressman. Moreover such paper cannot be taken directly from the cases and printed but must be stored in the pressroom, best in thin layers on racks, before it can be handled satisfactorily.

Such trouble as this can never be overcome entirely unless all printing houses maintain a definite humidity in their pressrooms, and all paper is sent out containing the moisture which it should at this humidity. This can probably never be accomplished, but it is at least an object to be worked for and approached as nearly as possible. Even if the paper manufacturer alone could fulfill his part of the program by sending out paper which would be in moisture equilibrium with an atmosphere of the average humidity it would be a distinct gain from the standpoint of the printer, since it would give him a more uniform product to

work with. It would also exonerate the manufacturer from blame in many cases in which he now receives complaints, and last, but not least, the paper could be used with little or no storage in the pressroom since it would be already seasoned before shipping.

In the opinion of the writer any scheme for producing uniformly humid paper will involve the control of the humidity in the rooms in which the paper is stored or finished. This should probably include the calender room, the winding room for roll papers and the cutting and sorting rooms for sheet papers. By maintaining a comparatively high humidity in these rooms much could be done toward improving the condition of the paper before it leaves the mill.

Importance to Printers.

Let us now try and look at this question of humidity and paper from the point of view of the printer.

When he receives a case of paper it may be either damper or drier than the surrounding atmosphere would call for. If it is damper it will lose moisture when taken from the case, and as this loss takes place most rapidly on the edges they will shrink more quickly than the centre which will consequently become baggy. If such paper is printed in this condition the press works the fullness to one side and the result is frequently a wrinkle or cut which spoils the job. If the paper when taken from the case is too dry it must absorb moisture, and as this change also takes place most quickly on the edges, they expand more rapidly than the centre of the sheet and become wavy. Paper in this condition also is almost impossible to print with good results. These two points illustrate the necessity of racking the paper, or exposing it to the atmosphere of the pressroom sufficiently long for the moisture to adjust itself throughout, and they also show what an advantage it would be to the printer if he could receive paper of a uniform moisture content.

It might be mentioned in this connection that the paper manufacturer is not always to blame for variations in the moisture in the paper since that which is sold through dealers is often stored in warehouses long enough to materially alter its condition. So far as the writer knows no attempt is made to hold paper in warehouses at a constant humidity nor is any particular care exercised in delivering the goods to the printer. If a case or roll is carted through the streets exposed to the sun on a hot summer day, it is not to be expected that the hot and cool sides of this case or roll would print just alike if used at once. It is probably not wholly a question of temperature either since the part exposed to the sun must become dryer due to the increased capacity of the heated air surrounding it for taking up moisture. Again we see why the wise printer insists on having the paper in his own shop for at least several days before he expects to use it.

Another way in which moisture seriously interferes with the printer is in its effect on the size of the paper. It is a well known fact that paper expands and contracts according as the moisture in the surrounding atmosphere increase or diminishes, and it is such changes in dimensions which cause nearly all of the cases of poor register. This fact is of extreme importance in color work, where the same sheet is printed several different times at intervals of several days, and where it is very essential that the different impressions should fall directly over one another. While many printers recognize changing humidity conditions as one of the prime causes of misregister, this is by no means true of all, and even in the larger and more progressive establishments there is no adequate attempt at its con-

tool. While it is possible to regulate the humidity within limits, the equipment required is quite costly, and rather than go to the necessary expense, most printing houses prefer to take a chance on the results. If it so happens that the humidity at the second printing is about the same as at the first impression good register generally follows, but if there is much difference in the humidity at the two printings then misregister is pretty sure to result even with the best of paper. In a shop where no humidity control is attempted nor any record kept of its daily variations, it is obvious that good work, so far as register goes, is largely a matter of luck.

The closeness with which two or more impressions should register depends on the type of work being done; for some jobs if they come within one one-hundredth of an inch it would be sufficient, while for other work the register should be practically perfect. It is obvious that the closer the register the better will be the result. The dimensions of the sheet handled have a considerable influence on the permissible expansion, as will be readily seen by considering the case of two sheets, one 25 x 38 and the other 40 x 60 inches. If these have the same percentage expansion with changing humidity, the results as to misregister will be quite different. If we assume a change in linear dimensions of 0.8 per cent, the first sheet would change in its longest dimension 0.3 of an inch, while the other would increase or decrease in length by 0.48 of an inch. This is an extreme case, but it illustrates the point that the percentage expansion which can be permitted in a paper depends on the size of the sheet used as well as on the grade of printing being done and shows that the larger the sheet the less satisfactory will be the register.

Very little work showing the influence of humidity changes on the dimensions of paper is on record. Prof. Dalen in 1895 published the measurements of three samples of paper at humidities ranging from zero to 100 per cent. He found the expansion much greater in the crosswise than in the lengthwise direction, and the maximum change which he recorded was 1.4 per cent of the length at 65 per cent humidity. He showed that the influence exerted by changing temperature was very slight when compared with that of humidity and found that when exposed to humidities over 80 per cent paper undergoes a slight permanent expansion. K. B. Lamb, in a recent technical journal published his observations on a number of papers which he measured at 0 per cent and 100 per cent humidity. He found the maximum expansion under these conditions to be 1.42 per cent in the crosswise direction and 0.73 per cent lengthwise.

Original Investigations.

As these results did not appear to cover the ground as fully as seemed desirable, the author recently undertook the examination of a considerable number of samples of book, offset, and coated papers. The apparatus used was practically the same as that employed by Prof. Dalen. It consisted of a double-walled galvanized iron box 13 x 18 x 5½ inches inside measurement, fitted with a plate glass cover which could be made tight by means of putty. Inside the box, at one end, were two large one-litre sulphuric acid, the other for water, and at the other end was placed a wet and dry bulb thermometer for recording the humidity. The access of the acid and water pans could be varied and limited by glass cocks connected through cocks in tubes in the plate glass cover, and by this means any relative humidity between 29 per cent and 96 per cent could be maintained. In the centre of the plate

glass was a hole through which a rod supporting a brass scale protruded; over this rod was slipped a rubber stopper whose flat under side made a practically airtight contact with the glass. By means of this rod and scale the paper, which was placed on a glass plate directly under the centre hole, could be measured at any time without disturbing the humidity conditions inside the box. A good circulation of air in the chamber was kept up by a small fan whose shaft also extended through the plate glass cover.

In using this apparatus cross-shaped pieces of paper were cut so that distances of 280 mm. could be marked off both across and with the grain. Two of these were placed on the glass plate so that all four measurements could be made by turning the scale. After making the cover tight the fan was started and the humidity run down to 29 per cent by absorbing the moisture in the concentrated sulphuric acid. Measurements of the distance between the marks were now made at intervals and when no change in length was observed after an hour's exposure to 29 per cent humidity, it was assumed that equilibrium had been reached. The next measurement was made in a similar way after the humidity had been brought up to 60 per cent, a third at 80 per cent and the final reading at 95 per cent relative humidity. The temperature during the tests was that of the room and ranged from 66 deg. to 89 deg. F.; the greater part of the observations were made, however, within much narrower limits.

In order to make sure that the four humidities selected for observations were about the conditions desired, three samples of paper intended for offset printing were measured at a large number of points. The following table gives the conditions and the percentage expansion based on the length at 29 per cent relative humidity.

Percentage Expansion.

Humidity change.	Paper 1.		Paper 2.		Paper 3.	
	Length	Across	Length	Across	Length	Across
29-40	0.0357	0.1072	0.0718	0.1436	0.0719	0.1796
40-50	0.0357	0.1071	0.0358	0.1437	0.0719	0.0718
50-60	0.0357	0.0715	0.0360	0.1077	0.0719	0.1076
60-70	0.0358	0.0713	0.0359	0.1077	0.0375	0.1078
70-80	0.1429	0.1070	0.1794	0.2873	0.0702	0.2872
80-87	0.0356	0.2143	0.0717	0.1806	0.1078	0.2155
89-97.5	0.1427	0.4656	0.2509	0.8620	0.2563	0.7905
29-97.5	0.4641	1.1440	0.6815	1.8320	0.6875	1.7600

From a consideration of these results it was evident that the points selected for readings were well chosen, and these four original humidities were adhered to for all other tests.

Studying next a number of papers which were known to print either well or poorly, the following results were obtained:

Percentage Expansion Between

Quality of printing.	Length	20 & 60%.		60 & 80%.		80 & 95%.	
		Length	Across	Length	Across	Length	Across
1 well	0	1.130	0.2148	0.1789	0.2859	0.2856	0.6443
2 poorly	0	1.364	0.2407	0.1818	0.2505	0.2273	0.5378
3 poorly	0	1.786	0.3828	0.1785	0.3822	0.2441	0.7230
4 poorly	0	1.786	0.4651	0.1427	0.3934	0.1428	0.8955
5 well	0	1.430	0.3978	0.1430	0.3923	0.1070	0.5729
6 well	0	1.783	0.2854	0.1070	0.3214	0.0715	0.5352

Of these papers 4 and 5 were coated, while 6 to 9 inclusive were made for offset work.

It is very evident from a study of the figures that the poor printing results cannot be laid entirely to the excessive expansion of the paper since other papers with equally great changes in dimensions print well. There does appear, however, to be a tendency for the satisfactory papers to expand less than the poor ones, but the difference is not so marked that a test of this nature could be applied to indicate before hand whether a paper will print well or not. These figures tend to strengthen the opinion already expressed that good register is largely a matter of luck in the pressroom.

The next point which it was attempted to investigate was the influence of the coating and calendering process in the manufacture of coated papers. Three different grades of paper were selected and the expansion determined before coating, and again after coating and calendering. Papers 10 and 11 contained satin white in the coating, while sample 12 contained clay only; all were casein sized.

Percentage Expansion Between

	29 & 60%		60 & 80%		80 & 95%	
	Length Across	Length Across	Length Across	Length Across	Length Across	Length Across
Paper 10						
Uncoated	0.1074	0.2506	0.0715	0.1423	0.1430	0.4301
Coated	0.1074	0.2506	0.1429	0.3219	0.2504	0.6085
Paper 11						
Uncoated	0.1074	0.2862	0.0715	0.3578	0.1072	0.5740
Coated	0.1431	0.2862	0.1073	0.4298	0.2503	0.7880
Paper 12						
Uncoated	0.1431	0.2870	0.1075	0.2151	0.0714	0.5739
Coated	0.1789	0.2870	0.1072	0.2151	0.1789	0.5739

It is evident from these tests that coating may or may not increase the percentage expansion over that of the plain paper. Whether the presence of satin white is the determining factor, it is impossible to say with certainty, but it is a peculiar coincidence that the two papers containing satin white expand more after coating, while that with clay only, shows hardly any increase. The difference is, however, not very serious in any case, especially below 80 per cent relative humidity, and taking into account the total expansion of the papers it would seem as though the slight extra expansion caused by the coating might be considered negligible.

It is often stated that paper which has been well seasoned prints with less trouble than when first made. To see whether this could be caused by a decreased percentage expansion after the paper had been seasoned two samples of offset paper were tested when first made and again at the end of three months, during which time they had been exposed to all atmospheric changes of an occupied room.

Percentage Expansion Between

	29 & 60%		60 & 80%		80 & 95%	
	Length Across	Length Across	Length Across	Length Across	Length Across	Length Across
Paper 13						
April 17	0.0715	0.3935	0.0715	0.3935	0.1073	0.8230
July 20	0.2152	0.5025	0.1440	0.2875	0.3233	1.0790
Paper 14						
April 17	0.1431	0.3936	0.0716	0.3577	0.1789	0.7517
July 20	0.2155	0.5020	0.1436	0.3590	0.2512	1.0770

These tests show an unmistakable increase in the percentage expansion at the end of three month's storage, and while no reason can be assigned for this be-

havior, it is evident that the superior printing qualities of seasoned paper cannot be attributed to any decreased tendency toward changes in dimensions with varying humidities.

During this test it was noticed that samples of paper which had been exposed to 95 per cent humidity and allowed to come back to room conditions had decreased in length both with and across the grain. This seemed to be a frequent occurrence, as a considerable number of samples were found to act in this way. To see whether the total change in dimensions took place on once bringing to 95 per cent humidity and allowing to dry out again, three samples were selected and measured first at 29 per cent relative humidity. They were then brought up to 95 per cent humidity, and again measured and this alternate measurement at 29 per cent and 95 per cent was repeated till the papers ceased changing in dimensions. The results of these measurements are as follows:—

Measurements in Millimeters.

	Paper 15.		Paper 16.		Paper 17.	
	Length Across	Length Across	Length Across	Length Across	Length Across	Length Across
Humidity.						
1st at 29%	279.5	279.1	279.3	278.6	279.3	279.0
1st at 95	280.7	282.0	280.7	282.7	280.9	282.3
2nd at 29	279.0	278.7	278.9	278.1	278.9	278.5
2nd at 95	280.4	281.9	280.4	282.2	280.8	282.1
3rd at 29	279.0	278.7	278.9	278.2	278.8	278.7
3rd at 95	280.2	281.7	280.4	282.1	280.7	282.1
4th at 29	279.0	278.7	278.8	278.1	278.8	278.6

The permanent contraction does not all take place on once exposing to 95 per cent humidity and again drying out, but the shrinkage on treating this way a second time is very slight. This permanent change appears to be slightly less in the crosswise direction than it is lengthwise, but both are of sufficient magnitude to cause serious trouble in register if the change is caused to take place. With a paper having this tendency it might, if it were used in a process which required the paper to be dampened, absolutely prevent good register. In all cases where the paper is to be seasoned it would be a wise precaution to see that this permanent change has been brought about before the first impression.

Conclusions.

The conclusions which were reached from this investigation were:

With changing humidity the crosswise dimensions changes much more than the lengthwise, but there is no constant relation between the two.

Between 29 per cent and 70 per cent relative humidity the rate of expansion is practically proportional to the rate of change in humidity, but above 70 per cent the expansion becomes much more rapid.

There seems to be no fixed or definite connection between the extent to which humidity affects the paper and the success with which it prints.

Coating in most cases slightly increases the effect of humidity on the dimension changes, but the increase is not enough to be serious.

Seasoning does not diminish the effect of humidity changes on the paper.

Many papers when exposed to 95 per cent humidity and again dried out undergo a permanent shrinkage which is of sufficient magnitude to be serious if it takes place between two impressions.

Paper which has undergone this permanent shrinkage shows the same percentage expansion when submitted to the usual tests.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

ORVILLE H. MOORE

General Manager of the Hinde and Dauch Company, Toronto

Any one who has even a nodding acquaintance with the pulp and paper industry of Canada, has heard of the famous Moore Rotary Screen, but it is perhaps not generally known that the inventor of this, the Adirondack Horizontal Screen, and other machines, is now one of the leading members of the trade in Canada. He is Orville H. Moore, General Manager of the Hinde and Dauch Paper Co., of Canada, Limited.



Just five years ago, in a small upper flat at the foot of Dufferin Street, Toronto, the company began manufacturing corrugated boxes and specialties. They then occupied only about 2,500 square feet of space. From the day that their double facing, corrugated and veneer cutting machines were put in operation, business, under the direction of Mr. Moore, started to expand, and a year later larger premises had to be secured. A former wall paper factory, offering larger capacity, was acquired on Hanna Avenue, still the business grew, but to trace its development to its present large proportions would be too long a story. Now over one hundred thousand square feet of floor space is utilized. A year or so ago a large and well-equipped paper mill was completed and a 24 inch machine in-

stalled, with a capacity of forty tons per day of all kinds of box board; together with six, 200-pound beaters, four Jordans, two large rotary printing presses and a complete composing outfit. A steel and concrete building, of mill construction, 265 x 60 feet, four storeys high, was erected to house the plant.

Progress did not even end here. Another forward step has just been taken. A large addition has been erected, 160 x 40 feet, in which a combination pasting machine—the first of its type in Canada—for making wall board, fibre board and fibre boxes, has been placed and will soon be in operation. This machine, built by the Downington Manufacturing Co., of East Downington, Pa. is 100 feet long by 80 inches wide, and has a capacity of twenty tons per day. In the production of the new lines, jute, chip and filled board will be used. Another 150 horse-power boiler has also been added making four in all.

In the making of corrugated boxes and containers of every kind, box board, pasted board, etc., the Hinde and Dauch Co. of Canada, have established a business that extends from coast to coast, having selling agencies in Vancouver, Winnipeg, Montreal, St. John and other cities. Their box plant alone consumes daily about thirty tons of jute, chip, filled and straw board, all being manufactured on the premises with the exception of straw board.

The company have invested in the last five years fully half a million dollars in plant and buildings and, to the fine showing that has been made, a generous share of the credit must be accorded to the subject of this sketch.

Although on the sunny side of forty, Mr. Moore has been associated with pulp, paper and board mills for the last twenty-seven years.

Born in the little town of Fort Edward in New York State, and surrounded by pulp and paper mills, he soon imbibed their atmosphere. He has won his way to the front by ability, industry and application. His father, a state bridge inspector in New York State, met death when the son was only nine years of age, thus young Moore was thrown on his own resources. He went to school in winter and spent his summers on a farm until he was thirteen. His first job in his life-work was in the rag room of the Glen Falls Co., now part of the International Paper Co. There he carried rags from the dusting machine to the rotary cookers. It was a dirty, dusty task—so disagreeable that he worked with a wet sponge in his face to keep the flying particles out of his mouth and nose. At other times on cold winter nights he was sent out with a rake to keep the anchor ice away from the racks so that they would not become clogged and stop the beaters, but he never complained, although often compelled to put in fourteen and eighteen hours a day. Being a husky lad he came in for much heavy labor. After becoming a back tender on one of the machines, he went over to the Howland Paper Co., of Hudson Falls, N.Y., which today is one of the plants of the Union Bag and Paper Co. There he was a machine tender for a number of years in the making of jute and bag

papers. He was sent to Hadley, N.Y., being promoted to the position of superintendent of a three-machine mill of the company, turning out bag paper, and also had charge of the erection of the machinery in connection with starting a ground wood plant for the same concern at Fennimore, N.Y.

During these years he had made a close study of pulp and paper mill equipment, and all his leisure time was spent amid drafting boards and blue prints, for he never tired of mechanical appliances. This pursuit was his hobby and delight. Steady progress was made, then one day after the patterns had been built, the patents secured in both the United States and Canada, the Moore Rotary Screen was heard of throughout the continent. It marked a distinct advance over anything that had ever before been placed on the market and its success from the outset was assured. Its action was vertical, its force centrifugal, its capacity large, its refining characteristics admirable while the power required to operate it was much less than that of any other screen that had been invented. Its efficient work and economical operation were soon recognized, many leading pulp mills of the country installing the screen. The inventor resigned his position and took up the sale of his patent paying numerous visits to Canada where sales were made to Clergue Mill at Sault Ste. Marie, Brompton Pulp and Paper Co., Clark Bros. and Co., Spanish River Co., Canada Paper Co., Montmagny Pulp and Paper Co. and others. The screens are in use to-day in these plants. Later Mr. Moore invented the Adirondack Horizontal Screen, operated by a propelling force, with a system of fans which has also met with considerable success.

After spending some four years in the interest of his inventions, he sold out his entire rights in the Moore screen to the Friction Pulley and Machine Works of Hudson Falls, N.Y., and next became secretary and manager of the Progressive Pulp and Paper Co., remodelling their plant at Lake Champlain, and building a new mill for the Lake Champlain Pulp and Paper Company at Plattsburg, N.Y., being the organizer of both these concerns. He then joined forces with the Dexter Sulphite and Paper Co. of Dexter, N.Y., and was manager of manufacturing in their Mitscherlich and ground wood mills, and two paper mills, which post he filled for several years. In 1908 he became identified with the Hinde and Dauch Paper Co., whose headquarters are at Sandusky, Ohio. They operate seven corrugated paper box factories and five board mills. Mr. Moore was sent to Hoboken, N.J., to take charge of the plant there, owing to the illness of the superintendent.

It was about this time that the company, which had been doing a large business in their line in Canada, decided, like many other progressive American concerns, to establish a factory in the Dominion, and Toronto was selected as the location. In January, 1909, Mr. Moore came over and shortly had a corrugated box plant under way. The following year the Hinde and Dauch Paper Co., of Canada, was incorporated with a share capital of four hundred thousand dollars, and while it has a working arrangement with the parent concern in Sandusky, it is in operation and management a separate organization in which Canadian capital is largely invested. For some time Mr. Moore looked after sales as well as administration and production, but the duties became too heavy and the volume of business so large, that the selling end was made a separate department three years ago.

Personally, Mr. Moore is of a most genial disposition, and optimistic temperament. He has always

taken infinite pleasure in the work with which he is associated and found his chief recreation amid mills. He loves to visit manufacturing plants, study machinery, transportation facilities and power problems. The bent of his nature may be well gauged from his first visit to New York City when a mere youth. He was a member of the volunteer fire brigade of Fort Edward, and one day the company was invited to the metropolis to participate in tournament before the Governor of the State. After the fancy drill was executed, the members scattered to see the city, their tickets being valid until the end of the week. Young Moore was not interested in Broadway, Coney Island, the Bowery or Wall Street, but spent days around the docks and railway depots, taking in every detail of shipping, loading, hoisting, etc. Then at midnight on Saturday, a few minutes before the time limit of his ticket lapsed, he boarded a train for home with only a penny in his pocket. He has always devoted his spare moments to mechanical pursuits, and in connection with the erection of the company's splendid board mill in Toronto, all the interior lay-out, offices, manufacturing departments and installation of the equipment represent the work of the General Manager, whose constructive and mechanical genius is such that he might almost be styled a pulp and paper mill engineer. Fraternally, Mr. Moore is a member of the Masonic Order and a Mystic Shriner. For recreation he occasionally takes spins in his automobile, but he would rather spend an hour in the garage taking the chassis apart and re-assembling it than to ride all day over rural roads or town thoroughfares at immoderate speed.

MANUFACTURE OF DARK-COLORED PAPERS.

When making better kinds of dark-colored papers in many cases it is sufficient to take unbleached or half-bleached pulp instead of bleached pulp. One thereby saves not only the bleaching agent, but also the dye requisite for giving the paper the required dark shade. Further, unbleached fibres have a greater affinity for dyes than bleached.

A very frequently required tint is, e.g., a brownish Bordeaux; this is best obtained by employing unbleached soda cellulose and a combination of Bordeaux and brown.

Deep red tints and also deep green and olive tints which are now frequently required are likewise preferably made from unbleached pulp.

In most of these papers (paper covers of catalogues, passe-partout, covers of files, better kinds of wrapping paper, etc.), fastness to light is important. This is obtained by employing mineral colors, but against their employment is the fact that they readily render paper flabby or limp when a certain limit is exceeded; also, it is not possible so to fix mineral colors that they do not come off when the paper is rubbed. Therefore, it is preferable to employ so-called substantive aniline dyes which are put on the market under various names, such as diamine, diamine genuine dyes, etc., and are sufficiently fast. As these dyes are almost completely absorbed by the fibre, there is less reason to fear complaints owing to colored waste water.

By observing the above hints the manufacture of many papers can be made more rational.—British Paper Trade Journal.

Chemical Pulp For Sausage Casing

By W. P. COHOE, E. C. FOX, and A. J. ACTON.

in the Journal of the Canadian Society of Chemical Industry.

Casings for sausage meats at present in use consist of the larger intestines of the ox, sheep, and hog, known in the trade as bungs; the gullet of the ox, known as weasands; and the smaller and middle intestines of the ox. For small sausage the smaller intestines of the sheep and hog are used. They have been used for many generations. No exception can be taken to them provided proper precautions are taken to insure their purity.

In the large packing houses the conditions of purity are more closely watched than in small butcher shops and abattoirs, but a sanitary substitute is highly desirable.

An ideal casing should possess the following properties:

The raw material should be pure and uniform. The process of manufacture should not permit any possibility of contamination by disease germs. The finished product should be of uniform chemical composition. It should be mechanically suitable. It should have a pleasing physical appearance. It should not provide a surface upon which mold and other organisms readily propagate. It should not contain substances injurious to the human organism. It should be, though in many cases not necessarily so, edible. If possible it should be digestible. It should be capable of being kept, stored and transported, under ordinary conditions, for an indefinite period of time, without deterioration.

So great has been the increase in the demand for sausage and bologna, and so drastic of late has been the condemnation of natural casings by Government meat inspectors, that the cost of natural casings is very high and likely to remain so.

There is a certain sized casing for which there is a great demand. Artificial casings can be made in any quantity to this standard at a less cost than the natural casings.

In order to find a substitute for the present casings, a survey of the field of possible raw materials was made, and it was finally decided to try cellulose (hydrate) and to use the viscose reaction of Cross and Bevan.

Bleached sulphite woodpulp is used as the raw material. This mercerized by the action of caustic soda solution, washed and treated by carbon disulphide.

On the addition of water swelling takes place, giving a thick viscous solution without a trace of fibrous structure. This material is then manufactured into tubes and passed into a salt solution, which converts it into a yellow jelly. The by products of the reaction are largely removed by washing in mixed solutions of sodium sulphides and bisulphides. Many of the salts are removed by heat, either by the direct action of steam, or by passing the tube through a hot solution, either of salts, alcohol, glycerine and many other substances.

The tube, which now consists of cellulose hydrate, together with adhering sodium salts, is washed thoroughly in boiling water. The length of time necessary to process in this way is first determined by an ash determination. When the amount of ash falls to an

amount equal to that in the original bleached sulphite pulp, freedom from impurities is assured. The tube is finally dried, conditioned, and rolled up ready for shipment.

Should colorless product be desired, the tube may be bleached after the hot wash. In this case it is led first through a hypochlorite solution, then washed in water, then led through this sulphate solution and finally washed in water.

At the present time containers of two sizes are being made, large sizes to replace beef bungs for the beef bologna trade and medium sizes in place of weasands for the ham bologna trade.

As soon as the necessary technical data can be obtained, it is proposed to prepare a small-sized casing corresponding to the sheep or hog casings.

Bleached sulphite pulp is pure, abundant and uniform. The chemical treatment it undergoes insures an aseptic condition. In cellulose (hydrate) we have a definite chemical compound, carrying with it slightly varying proportions of water. Inorganic impurities are limited to the small proportion of ash, 0.53 per cent mainly consisting of alkalis and alkaline earths. The finished product contains less ash than the original woodpulp.

As the weight of a sausage casing of cellulose (hydrate) averages 1.04 to 1.12 per cent of the meat, it may be seen that the ash present is insignificant. Still it is in the interests of careful manufacture to set a standard for this.

The experience in Canada with the use of the new product showed that its mechanical properties were satisfactory. Though the origin of the casing was known to the store managers, yet the man behind the counter, who had been handling sausages for years, did not recognize the change of material.

Cellulose (hydrate) casings are transparent and colorless in thin films when unbleached, and when bleached are colorless in all usual thickness. The surface is smooth and glossy, and does not easily afford a lodging place for mold or bacteria. Even supposing they do lodge there such a surface does not furnish food for their growth. This is quite the opposite of the conditions characteristic of the casing hitherto in use. In the case of our product, we have something in the nature of a preservative coating or container. This is particularly true in the case of cooked sausages, where the casing dries rapidly.

Our product when finished contains cellulose (hydrate), moisture, glycerin and ash. The human organism is quite accustomed to cellulose in its varying forms in the ordinary diet. For instance, white cabbage contains 63.25 per cent of cellulose (Hoesslin; Z. Biol. 54,395).

For purposes of comparison it is interesting to note the proportions of fiber carried by various cereal products in common use.

Product	Fiber.	Ash.	Authority.
Wheat flour (finest)	0.3	0.5	Konig
Wheat flour (American)	0.3	0.6	Johnson
Oat meal (American)	0.9	2.0	Johnson
Maize meal (American)	2.0	1.5	Johnson
Whole wheat flour	1.6	1.9	Richardson

There is a lack of uniformity between the results given by various authorities, due undoubtedly to the method used by the older investigators in determining "crude fiber." This error is very large. As much as 30 per cent of the weight of sawdust can be hydrolyzed

by 1 per cent hydrochloric acid under certain conditions. (See also Krauch and Becko, *Laudw., Vers. Stat.*, 27, 5; Cross and Bevan, *Jour. Soc. Chem. Ind.*, 1903, pp. 165 et seq.) Variations of method probably account for such results as are shown herewith.

Average Composition of Flour of Cereals

Cereal	Cellulose	Ash
Oldwheat	8.3	1.6
Barley	11.5	2.8
Oats	1.0	2.2
Rye	6.4	1.8
Maize	14.9	1.6
Rice	0.2	0.9

Taking the mean content of 1.8 per cent of cellulose in American wheat, obtained by Richardson, after 407 analysis (*Am. J.*, 302), and remembering that the casing of a sausage is from 1.04 to 1.12 per cent of its total weight, it will be seen that the eating of many of the prepared breakfast foods made from whole wheat, e.g., shredded wheat biscuit, involves a larger percentage of cellulose than does the eating of a sausage with cellulose (hydrate) casing).

Furthermore, it can be shown that cellulose (hydrate) is in a form more susceptible of chemical attack than is the hard covering of the cereal grains. To confirm this last point, bleached sulphite woodpulp and cellulose (hydrate) casing were treated side by side

at 100 degrees C. with first 0.50 per cent hydroxide acid, and secondly with 0.50 per cent sodium hydroxide solution. The results were as follows.

	Pulp	Casing
Dry weight	1.7678	1.6258
Weight after 5h. acid treatment . .	1.6468	1.3848
Weight after 4h. alkali treatment . .	1.2278	0.8114
Percentage dissolved in acid . .	6.74	14.82
Percentage dissolved in alkali . .	23.80	35.27
Total percentage dissolved . .	30.54	50.09

Thus cellulose (hydrate) is more easily attacked than normal cellulose and cannot be looked upon as harmful. The ash content of our product, 0.53 per cent, is so small that it may be neglected.

Edibility is demanded only in the case of small sausages, the casings of which consist of intestines of the sheep or hog. The casings of sausages of the Bologna variety cannot be masticated in any reasonable length of time, and are simply coverings or food containers. The meat of the sausage also does not adhere to the casing when made of our product, as it does to the old ones. A Bologna casing made of cellulose (hydrate) can, however, be masticated. In such a case a soft non-irritant mass is produced. In the case of the smaller sausages, the thickness of the casing is very small (0.204 to 0.006 in.).

RESEARCHES ON ROSIN SIZE

By PROF. MARCUSSON.

(Translation from "Teknisk Tidskrift" made specially for Pulp & Paper Magazine by C. E. Bandelin.)

By "rosin size" is usually understood a mixture of rosin-alkali-soap and free rosin, which is extensively used for sizing paper, and which is obtained by boiling colophony with a solution of soda and sodium hydrate. The purpose of the sizing is to make the paper impermeable to the liquor used for writing or printing (ink, India ink or colors), and to give the paper greater strength and better appearance.

For sizing, the size is dissolved in sufficient water to render the total amount of rosin about 20-50 grams per liter. The more or less milky liquor is then added to the paper pulp in the beater. The finely distributed rosin size is treated with a solution of alum or sulphate of aluminum, when a salt of aluminum, insoluble in water is precipitated, which together with the free rosin also precipitated envelops the paper fibres and gives the paper its impermeability to ink.

A test of rosin size of normal composition may be done either by gravimetric or volumetric methods.

The following method is recommended by Balenz:—2.3 grams of rosin size are dissolved in about 25 cub. cm. of hot water. The solution is washed into a separating funnel of about 300 cub. cm. and 50 cub.

cm. of $\frac{1}{10}$ N H_2SO_4 are added. The rosin separates out

and is shaken up with ether. The ether solution is washed twice with water, and the wash water is poured into the water solution previously obtained. The water solution is once more shaken up with ether, after which the sulphuric acid not consumed is titrated

back with $\frac{1}{10}$ N NaOH. If n cub. cm. of NaOH have been used so have $50 - n$ cub. cm. of acid been consumed to neutralize the alkali in the rosin soap. The composition of the soap is then: Alkali as $\text{Na}_2\text{O} = (50 - n) \cdot 0.0031$ gr. Combined rosin acids (molec. weight 302), calculated as hydrates = $(50 - n) \cdot 0.0302$. Combined rosin acids, calculated as anhydrides = $(50 - n) \cdot 0.0293$.

For determination of free rosin acid and unsaponifiable rosin both the ether solutions are united and

titrated with $\frac{1}{10}$ N solution of potassium hydrate in

alcohol in presence of phenolphthalein. If m. cub. cm. are consumed so are rosin acids and unsaponifiable rosin (total rosin) = $m \cdot 0.034$, rosin acids = $m \cdot 0.0302$, unsaponifiable rosin = $m \cdot 0.034 - 0.0302 = m \cdot 0.0038$, free rosin acids $0.0302 (M + n - 50)$.

The following is a common schema for the composition according to analysis:

Alkali calculated as Na_2O	%
Rosin, combined (as anhydride)	%
Rosin, free (acids + unsaponifiable)	%
Water and impurities (balance)	%

100.0%

The percentage of water can, besides, be determined by the xylol method directly.

The testing method, according to Dalen, may be used for analyzing rosin size of normal composition. Special methods, however, are required for sizes, now frequently occurring in the market, which may contain animal glue, vegetable glue, casein, albumen, starch, dextrin, gummi arabicum, viscose, etc. The analysis may be executed in the following manner when these substances are present:

The solubility of the size in alcohol is first tested. Rosin size of normal composition is dissolved already at usual temperature. The additional substances mentioned above are insoluble in alcohol and can therefore easily be separated off and determined quantitatively. The substances insoluble in alcohol are tested for percentage of ash, to find out if such materials as clay, heavy spar, etc., have been used as adulterants. A test for nitrogen is made if no ash is found. Two cases may then occur:

1.—The substances, insoluble in alcohol, are free from nitrogen. Glue, albumen and casein can in this case not be present, but starch, dextrin, gummi arabicum and viscose.

In most cases it is starch, that has to be taken in consideration. This substance is recognized microscopically from its characteristic form and from the blue color caused by iodine solution. Starch can be distinguished from dextrin and gummi arabicum on account of being only with difficulty soluble in cold water. Dextrin and gummi arabicum are distinguished on account of the behaviour with acetate of lead solution. Gummi arabicum is precipitated, while dextrin remains in solution.

Viscose (alkali-cellulose-xanthogenate), is dissociated by treatment with diluted mineralic acid; sulphide of hydrogen is formed and cellulose hydrate is separated out.

2.—The substances, insoluble in alcohol contain nitrogen. In this case the substances are first tested for animal glue. Vegetable glue, albumen or casein occur only seldom. Animal glue is completely soluble in water; the solution is precipitated by acetic acid. The percentage of nitrogen in animal glue is about 18 per cent. the percentage of sulphur is low (0.2—0.25%). Animal glue forms with tannin a double combination, with difficulty soluble in water.

Albumen is soluble in cold water like animal glue, but is precipitated when heated.

Casein is insoluble in water as such, but is soluble in combination with an alkali. These alkali combinations are dissociated by acetic acid and albuminous substances, free from alkali, separate out. Casein is distinguished from other albuminous substances on account of its percentage of phosphor (about 0.8%).

Substances, free from nitrogen such as starch, dextrin, and gummi arabicum, can of course also be present if nitrogenous substances have been found in rosin size. Of these the starch is easily recognized by the iodine reaction. For dextrin and gummi arabicum the nitrogenous substances must first be precipitated with an excess of tannin solution. The precipitate is filtered off, the filtrate is evaporated to dryness, and again dissolved in a few cubic cent. of water. An excess of alcohol is added to the water solution. The tannin excess is dissolved in the alcohol, while dextrin and gummi arabicum are precipitated, and determined with acetate of lead as mentioned above. If no precipitate occurs but only a weak bulkiness, when alcohol is added, it may be concluded that dextrin and gummi arabicum are not present.

After the substances insoluble in alcohol have been separated out from a rosin size and tested as described above, there remains only the determination of substance soluble in alcohol, which as a rule consist only of rosin and sodium resinate. This determination is executed in the usual manner.

DUPLEX PAPERS.

In spite of the many known processes the coloring of paper on the paper machine is an operation which has not been largely adopted as it cannot always be combined with the production on a large scale generally required at the present day. Generally the reason of all the difficulties is that the color applied on one side goes through. This defect is obviated by the ingenious patent of H. Gossler, according to which the color is applied to the paper shortly before it runs on to the large drying cylinder for being glazed on one side. The steam produced in the paper drives the particles of coloring matter away from the uncolored side to the outside of the paper web, so that the web appears uniformly colored. It is rarely that the color goes through the paper. The Gossler's process applies too much color to the paper and renders the drying operation difficult. An addition of spirit to the color helps somewhat, but is expensive. A roller which runs directly in the color and against which the paper web is pressed by means of a rubber roll works better. The rolls must either run in ball bearings or be driven. The colored side of the paper which is still wet may not contact with a paper-carrying roll or with the surface of the drying cylinder, because daubing will otherwise occur. As moistening of such papers with water is not possible because the color would be printed on to the uncolored side when rolling up the paper web, steam is used for moistening either on the machine by means of an apparatus in which the steam is brought into contact with the uncolored side of the paper by means of a box like a suction frame, or on the calendar. It is not easy to color this paper exactly according to a pattern because the tone of the uncolored web may impair the tint.

PROGRESS AT BELGO PLANT.

The construction of the new 50 ton sulphate plant of the Belgo-Canadian Company at Shawinigan Falls is going ahead favorably, and will be completed in about fifteen days' time.

The rest of the mill is running to full capacity, and turning out from 100 to 165 tons of groundwood and 125 tons of paper per day.

WOOD IS CONTRABAND, SAYS GERMAN DECREE

Copenhagen, November 25, via London. The Imperial German Government has made it known that all wood will be considered as contraband.

Private advices from Stockholm say that the greatest excitement prevails there as a result of this ruling. A number of ships loaded with timber to a total value of 30,000,000 kroner are lying in Swedish ports ready to put to sea.

The Swedish foreign office lodged a protest with Berlin.

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The mill now under construction to replace the Riverside pulp mill at Skowhegan, Me., that was burned during the summer will probably be equipped and ready for business about July, 1915. Considerable new machinery will be added, it is expected, but the building will be about the same size and along the same lines as the old one.

After several weeks, the St. Regis Paper Company of Northern New York which has been running without a nominal general manager, selected L. B. Stewart of Munising, Mich., who for seven years has been connected with the Munising Paper Company. Mr. Stewart will take over the management of the St. Regis Company at once, assuming charge of the several mills. It is claimed that he is one of the most capable and efficient paper manufacturers in the business. He will succeed David M. Anderson, who several weeks ago severed his connection with the company entirely, disposing of his stock to G. W. P. Gould of Lyons Falls, and throwing the control to him. Since that time Mr. Gould has been managing the company.

Bonds of the Battle Island Paper Company of Fulton, N.Y., to the amount of \$45,000 held by the City Bank of Syracuse as collateral on loans, were reduced to ownership last week when at public sale the bank bought the securities for \$11,250 (25 cents on the dollar). This was in accordance with the recent order of Judge George W. Ray of the United States District Court.

Frank L. Moore, of Watertown, N.Y., president of the American Paper and Pulp Association, has recently had three honors conferred upon him. He was re-elected president of the Empire State Forest Products Association, delegate to the third annual meeting of the National Association of Conservation Commissioners held in New Orleans two weeks ago, and delegate of the New York State Waterways Commission at the eleventh annual convention of the National Rivers and Harbors Congress to be held in Washington, D.C., December 9, 10 and 11.

In discussing the china clay situation, a leading New York dealer this week said to your correspondent that the trade is operating freely in this market, and sales are of satisfactory proportions. Foreign material is commanding \$16 to \$18 a ton, and domestic \$8 to \$9 a ton, according to quality. Imports of china clay in September amounted to 23,640 tons, valued at \$169,192 against 4,116 tons, valued at \$32,273 in September of last year. Imports for the nine months ending September were as follows:—

	Tons.	Value.
1914	212,264	\$1,396,480
1913	183,832	1,243,030
1912	194,382	1,269,301

The annual meeting of the Association of Dealers in Paper Mill Supplies of New York was held on Wednesday evening, November 11, and all officers were re-elected. Adolph Salomon of 140 Nassau Street, will

serve as President for another term, and Frank C. Overton, of Castle, Gottheil & Overton, continues on his second term as vice-president. The secretary, Fred H. Chase, of Chase & Norton, and treasurer Daniel M. Hicks, continue in the capacities which they have filled since the organization of the association. In the election of the executive committee there was one change in the personnel of the body that ruled last year. Andrew Ragone, of the Main Paper Stock Company, was elected to the committee to succeed P. McNeel, of William Hughes and Co. The other members of the committee are Robert B. Atterbury, of Atterbury Brothers, James Pirnie, of Edwin Butterworth & Co., Edward Smith of Thomas Smith & Sons, Inc., and Louis Darnstadt of Darnstadt, Scott & Courtney.

The steamer Oregonian arrived at Poughkeepsie, N. Y., last week, with a large cargo of Douglas fir from Seattle, Wash., via the Panama Canal. It was the first of a line of lumber carriers and was an event not without significance. According to good authority, this Douglas fir can be shipped to New York from Washington via the canal, to sell at about \$20 a thousand, and is lumber that competes directly with Maine spruce, which cannot be produced for lumbering uses at that price, let alone to sell at a profit. This may be one of the reasons why the spruce cut in the Maine woods for lumber is to be one of the smallest in years, and it is an indication that spruce is destined to be used more and more for pulp and less for lumber in the State of Maine.

John G. Luke president of the West Virginia Pulp and Paper Company of 200 Fifth Avenue, New York, has purchased the Millett estate at Irvington, N.Y., which is valued at about \$300,000.

Richard Gray of 534 Franklin Street, Watertown, N.Y., the regular erecting man of the Bagley and Sewall Company, employed by that concern to travel, wherever needed and erect paper machinery, sailed last week from New York on the S.S. St. Paul for Paris, to France to put up some machinery for the Papeterie de la Seine. He will remain there for about two months putting up machinery for the Watertown Company. Mr. Gray has travelled all over this country for the Bagley and Sewall Company and supervised the setting up of machines. He had planned to go to Paris several months ago, before the outbreak of the war, which made it necessary to postpone his trip, which it is now expected that he can make with safety.

The Northern New York paper makers who have responded to the call of French manufacturers for help, necessitated because of the war, which drew many of the French paper makers to the front, will not leave until some time this week. The request was made by the French concerns through Stuart D. Lansing, the secretary of the Bagley & Sewall Company, and immediately in the neighborhood of 100 volunteered. But eight, however, will go at the present time.

In a decision arising under the new tariff law the Board of General Appraisers has over-ruled the protest of the Dennison Manufacturing Company and others on the assessment of duty on tissue paper under paragraph 323 at 30 per cent ad. valorem. The importers claimed classification as wrapping paper not specially provided for under paragraph 328 at 24 per cent. It appeared that the tissue paper is known as "grass bleached tissue" and sold as a wrapping paper to manufacturers of gold or silver ware. It was shown that the chief use is for wrapping purposes. Judge Fisher conceded that the paper is a wrapping paper, but decided that it belongs to a distinctive classification as "wrapping paper" known in trade as "tissue paper." He held that Congress intended to make special provision for all tissue papers without exception and that the provision for wrapping paper, paragraph 328, is confined to wrapping papers as are not specially provided for.

The last load of pulpwood to be brought down Lake Michigan until navigation opens next spring, has just been landed at Michigan City, Mich., for the French Paper Company of Niles. The pulpwood was loaded at Richards Landing, Ontario, and it was shipped by rail from Michigan City to Niles. The French Paper Company gets all of its pulpwood by the lake route, and it has a sufficient amount on hand to last it until the lake season opens next spring. The barge, O. E. Parks, which brought the load down, has for years been used by the paper company to secure its pulp supply and fortunately it has never been hit by one of the severe storms which sweep the lake at this time of the year.

THE PULP SITUATION IN SCANDINAVIA.

(Special to Pulp and Paper Magazine.)

New York, Nov. 25, 1914.

H. B. Steffanson, who is widely known in the United States and Canadian pulp industries, returned several weeks ago from Sweden, where he had been for about six months. Though he was in the army drilling recruits part of the time, he studied the pulp situation in Scandinavia very carefully, and secured his leave of absence to return to this country. Mr. Steffanson has been manager of the pulp department of Charles F. Hubbs & Company, Lafayette and Fourth Streets, this city, but he has severed that connection and this week branched out for himself, under the firm name of Steffanson & Co. He has made connections with several Scandinavian mills and has a good quantity of pulp on the way. He is located at 30 E. 12nd St., New York.

In discussing the Scandinavian pulp situation brought about by the war, Mr. Steffanson says:

"The war has changed the paper and pulp markets of all the world," he said. "In Scandinavia two weeks after the war broke out nobody engaged in manufacturing or shipping thought it would be possible to make further shipment pending hostilities, and for that reason and also to the scarcity of labor account of the mobilization of the armies in both Sweden and Norway and a number of pulp and paper mills were closed. Later, however, when the situation could be viewed more clearly and thanks to the clear-sightedness of European Governments, trade was resumed wherever possible. The Government, for instance, limited reasonable rates and built on vessels but on cargoes of European countries. At the outbreak of

the war strong sulphite advanced from 130 to 165 kroners F. O. B. Scandinavian ports, England being the principal buyer. Great Britain had also to supply France with paper for their newspapers and periodicals. Easy bleaching sulphite went as high as 180 to 200 kroners F. O. B. and considerable quantities were placed at these figures for immediate shipment. Hardly any kraft pulp was available outside of contracts already placed, and such lots as were sold for immediate shipment commanded about 160 to 165 kroners F. O. B. net cash.

"It must be remembered that Finland, for years the principal supplier of sulphate pulp, is not in a position to ship at present. The principal ports of that country, such as Wiborg, Hango, and Kotka, have been closed to navigation by the Russian authorities. The small quantities that have been shipped since the war began, in all not more than a few hundred tons, have been sent via Raumo, but this port is so overloaded with more necessary goods that they do not care to handle an article like wood pulp on a large scale. In fact, they would block Russian commerce completely via Finland and Sweden, if they attempted to do so, and besides this the extra cost involved for pulp transportation has risen about \$5.00 per ton. By reason of these obstacles most of the Finnish sulphate mills have been closed, and so are many other industries, with the exception of those supplying Russia.

"German mills are more or less dependent on Russian wood and so long as hostilities last they will be unable to get further supplies. With what they have now on hand they can, of course, keep their mills in operation, but in 1916 they will probably have to close for lack of raw material.

"Sweden and Norway have found it very difficult to keep going. Coal soared in price and was difficult to secure. Sulphur was at a premium, money was scarce and shipping difficult, and to cap the climax, the country suffered from unusual drought. Not in a generation have the rivers been so low as they are now. Those mills which can afford to do so are putting in steam power so as to be independent during the winter, and it is feared that cold weather following this severe drought will add considerably to the difficulties of the situation. With a higher cost for everything, the pulp mills are entitled to higher prices than those prevailing before the war, and manufacturers take a correspondingly rosy view of the situation. With a higher cost for everything, the pulp mills are entitled to higher prices than those prevailing before the war, and manufacturers take a correspondingly rosy view of the situation from a seller's standpoint. Hardly any stock for this year remains unsold and goods placed previously in France find a ready market elsewhere at advanced prices. France, however, has begun to take delivery again; a steamer from Sundsvall left for Rouen loaded with sulphite pulp in October.

"The Baltic will soon be closed to navigation and the manufacturers are not inclined to sell now for next season except at their own terms.

"There are no stocks anywhere of kraft pulp. Easy bleaching sulphite is so scarce that English buyers have had to content themselves with ordinary strong sulphite in some instances. Finland's products of over a hundred thousand tons of sulphite being cut off, it means that kraft is in a better position than anything else and a considerable advance is to be expected later on."



BRITISH TRADE NEWS



SPECIAL TO PULP & PAPER MAGAZINE

London, November 16.

An event of great importance in the British paper-making industry was the autumn general meeting on November 5th of the Papermakers' Association of Great Britain and Ireland, Mr. Joseph Dixon presiding in the absence of the President owing to official duties. There were also present Sir John Thomas, Messrs. John Dobson, H. W. T. Garnett, Howard Peebles, J. C. Hutchieson, Wm. N. Bates, Chas. King Smith, J. R. Alexander, J. E. Jepson, Cuthbert Dixon, C. Barton Smith, T. D. M. Burnside, Herbert Green, J. G. Entwistle, R. Gilroy, A. E. Reed, T. Parker Smith, John Charnock, A. de Burgh Wilmot, W. W. de Buriatte, D. Clegg, A. Saword, W. A. Kershaw.

The question of railway rates and demurrage was first taken up, resulting in a recommendation to lay an application before the local Chambers of Commerce.

The energetic Secretary, Mr. Alfred W. Foster, read his report, showing that the recently instituted plan of securing co-operation among the papermakers to the end of getting low rates with the British Dominions' General Insurance Company, was being received with great favor.

On the question of terms of credit for wood pulp and paper, Mr. Gilroy said the Northern Committee had been in consultation on the question of the cash payment of wood pulp before shipment, and they considered it one that the Association ought to deal with rather quickly. Demands had been made for cash payments before the stuff was actually shipped, which was quite contrary to any of the contracts in question. The Northern members felt that if these demands continued to be pressed, the situation might become rather aggravated, and in that connection it was suggested that their Association should approach the Wood Pulp Association on the matter, so that the normal terms of payment should be made and come into effect quickly. It was true that in many cases the mills had been rather short of supplies, but he believed to-day the difficulties had been pretty well got over. They were given to understand that after the moratorium had expired the normal condition of things might be expected. In some cases at least that was not so; they had received information that there were sellers of pulp to-day who were demanding and exacting cash payment before deliveries were effected. It was a subject that ought to receive some consideration at that meeting, and if it was at all possible normal terms of payment should be reverted to as early as possible.

The opinion was expressed by the Chairman and others that the trouble alluded to would be found to be largely over.

The chairman thought that there ought to be a custom that instead of handing out the whole of the money, they ought to hand out 90 or 95 per cent of the money. They had done this in many cases, unless they had the personal guarantee of the agent and he became personally responsible. If members of the Association adopted that policy, of only paying or accepting 95 per cent of the goods and leaving a balance over until the contents of the parcel had been ascer-

tained, they would be carrying out their business in a better way than by trusting to bring an action against the foreigner or whoever he might be, but mostly a foreigner—for a reduction for any arrears in his invoice. He threw this out as a suggestion to members; it was a policy they were adopting wherever they possibly could.

The Chairman said they all agreed with Mr. Gilroy, that if they could get all their customers to pay every two or three months it would be of very great assistance to them in the conduct of their business. But he did not think it was possible for them to interfere with regard to the terms of credit generally. If they sold to their customer at a low price, depending on him for cash payment, and if the following month he did not pay, then it was for them to press him to fulfill his engagements. But he did not think it was possible for them to adopt a hard-and-fast rule with regard to terms of payment from their customers.

In the matter of esparto supplies, the Secretary explained that there had been some difficulty in the collection of the Oran esparto crop, owing to some dispute as to the manner of the French Government's payment of the native labor. The matter had been taken up by the Association, and representation had been made to the Foreign Office and other Government departments. The last information he had was that the situation had perceptibly eased, and possibly the esparto crop would be saved. With regard to the exportation of rags, a letter had been received from the Board of Trade stating that they were not prepared to issue an order prohibiting the exportation of rags for papermaking. That did not put an end to their desire and activities in this direction. Intimation had been received that the matter of the exportation of rags was to be brought before a Cabinet Committee, and an effort made to prevent British rags being bought up and exported.

A motion followed, to the effect that measures be taken to prevent the exportation of rags and raw fibres from this country, but not applying to waste paper.

The discussion on the difficulty into which the industry had been thrown as a result of the cutting off of dye supplies from Germany, terminated in a motion: "That the attention of the Government be called to the importation of foreign papers dyed with German dyes, to great prejudice of British manufacturers of paper, who are prohibited from obtaining these dyes."

When the business meeting was over the members of the Association sat down to dinner in the evening, and owing to the informal way the proceedings were arranged a very happy and pleasant time was spent. The event also afforded the members an opportunity of discussing matters appertaining to paper manufacture and trade conditions in a private and helpful manner, whilst those who were disposed to talk business enlivened things by their opinions on our tariff policy and the subsequent effects predicted of the great European war which we are now passing through.

Toasts to the King, and the President, were honored, and after a gay hour in witty speeches, a most successful meeting came to a close.

Brief of report by "World's Paper Trade Review.")



NEW PATENTS



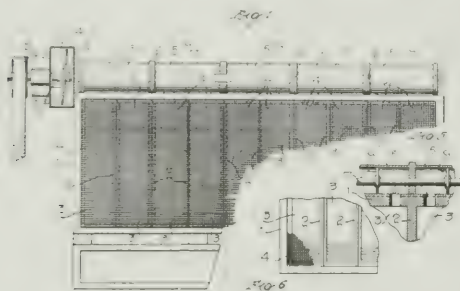
PAPER AND PULP SCREEN.

Zenford Terrian and James Lennon, Jr., of Fort Ed-
Ward, New York, Patentees.

Patented in United States Patent Office, Oct. 27, 1914.

The inventors say: This invention relates to certain improvements in paper and pulp screens and has relation more particularly to a device of this general character wherein suction is employed to draw the pulp through the screen plates; and the object of the invention is to provide a device of this general character having novel and improved means for creating the requisite suction action and wherein such means is positioned to one side of the plates.

The invention consists in the details of construction and in the combination and arrangement of the



several parts of our improved device whereby certain important advantages are attained and the device is rendered simpler, less expensive and otherwise more convenient and advantageous for use, all as will be hereinafter more fully set forth.

The novel features of the invention will be carefully set forth in the appended claims.

In order that our invention may be the better understood, we will now proceed to describe the same with reference to the accompanying drawings, wherein—

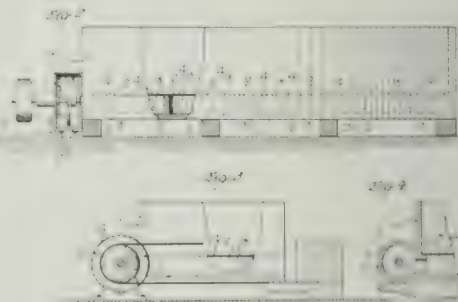
Figure 1 is a view in top plan with parts in section of a screen constructed in accordance with an embodiment of our invention. Fig. 2 is a view in front elevation with parts in section of the device as embodied in Fig. 1. Fig. 3 is a view in end elevation of the device as herein disclosed. Fig. 4 is a fragmentary sectional view taken through one of the cylinders herein disclosed and its concomitant parts. Fig. 5 is a horizontal sectional view taken through adjacent cylinders as herein disclosed. Fig. 6 is a fragmentary view in elevation illustrating in detail the screen plates herein disclosed.

As disclosed in the accompanying drawings, 1 denotes a suitable supported vat provided with a plurality of partitions 2 whereby the chambers 3 are afforded such partitions being of predetermined height, and the chambers thus created are inclosed in any suitable manner by the screen plates 4. Suitably supported adjacent opposite ends of the vat 1 are the cylinders 5, herein shown as disposed in substantial continuity,

each of such cylinders being of such a length as to intersect the ends of two adjacent compartments 3 and being in communication with such compartments, as indicated at 6. Extending through each of the cylinders 5 is the common rod 7 adapted for sliding or reciprocal movement therethrough and having one end projected beyond an outermost cylinder 5 whereby a suitable operating means may be affixed, such means being herein shown as a belt or band wheel 8 adapted to be coupled, in the usual manner, with any source of supply. Fixed to the rod 7 within each of the cylinders 5 and at a point intermediate the communicating ports 6 is a disk 9 which upon recurrent or reciprocal movement being imparted to the rod 7 is adapted to result in the requisite suction action within the adjacent chambers 3, for purposes which are believed to be clearly apparent to those skilled in the art to which our present invention appertains.

In order to impart the requisite reciprocation or recurrent endwise movement to the rod 7, we herein disclose affixed to the projected portion of such rod the cam disk 10 adapted to travel through the guideway 11 afforded by the spaced blocks 12, such blocks being herein shown as suitably affixed to the annular band 14 suitably secured to the adjacent end of the vat 1. By this arrangement, it will be observed that as the rod 7 is rotated, the formation of the cam disk 10 is such as to result in reciprocation of the rod and it is thought to be obvious that the extent of reciprocation of the rod can be regulated by varying the pitch of the cam disk.

From the foregoing description, it will be obvious that a paper and pulp screen constructed in accordance with our invention is of an extremely simple and comparatively inexpensive nature and is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and of the



effectiveness with which it performs its requisite functions and it will also be obvious that our invention is susceptible of some change and modification without material departure from the principles and spirit thereof and for this reason we do not wish to be understood as limiting ourselves to the precise arrangement and formation of the several parts herein shown in carrying out our invention in practice.

Having thus fully described our invention what we desire to claim and secure by Letters Patent, is:—

1. The combination with a vat provided with a plurality of chambers, and screen plates for covering such chambers; of a cylinder common to adjacent chambers and in communication therewith through suitable ports produced in the adjacent wall of the vat, a rod capable of endwise reciprocal movement within such cylinder, a disk within the cylinder fixed to such rod at a point intermediate the points of communication between the cylinder and the adjacent chambers, and means for imparting reciprocal movement to the rod.

2.—The combination with a vat provided with a plurality of chambers, and screen plates for covering such chambers, such chambers being arranged in a series of chambers and in communication therewith through suitable ports produced in the adjacent wall of the vat, a rod common to all the cylinders and directed therethrough and capable of reciprocal movement, a disk fixed to such rod within each of the cylinders intermediate the points of communication of such cylinder with the adjacent series of chambers, and means for imparting reciprocal movement to the rod.

PROCESS FOR THE RECOVERY OF PULP FROM WASTE PAPERS.

John M. Burby, of Astoria, New York, Patentee, Assignor to the Pembee Company, of New York.

Patented in United States Patent Office, Oct. 6, 1914.

The inventor says: In the processes for the recovery of pulp from printed waste papers, described in the literature and Letters Patent relating to the art, solvents are employed to dissolve or saponify the oily constituents of the printers' ink, and in some of these directions are given to boil such waste papers in the stated solvents, or to subject them to the action of such solvents heated by steam under pressure, to reduce or destroy the adhesiveness of the ink, sizing, etc., to facilitate the separating of the pulp fibers therefrom. The grades of paper, known collectively as print or "news print papers" and some grades of "book papers" are made partly—some of them largely—of wood fibres, produced by grinding of raw wood. This material, known as the "mechanical wood pulp," differs from the "chemical" or "sulphite" pulp in that the fibers of this "mechanical" pulp, not having been subjected to the chemical process—digesting—retain the nature of raw wood. When waste papers, made partly of this "mechanical" wood pulp, are subjected to the action of such, or of strong solvents as are to be used in the processes heretofore known, or of such solvents heated, or under steam pressure, the raw wood fibers are discolored. This discoloration is very similar to that produced by exposing such papers to strong sunlight and cannot be obliterated, because the fibers of mechanical wood pulp are detrimentally affected by bleaching, and liable to be rendered thereby wholly unfit to be used again, except probably as a filler. The more concentrated, or the hotter the solvent is employed, the more intensive is its discoloring effect, and the larger the proportion of the mechanical wood pulp is contained in the waste papers, the more pronounced is the discoloring effect upon all the pulp recovered. The fibers of the so-called "chemical" pulp are not so discolored by these solvents, or by subjecting them to the action of such solvents in highly heated state, but as it is not practically feasible, to separate the fibers

of this "chemical" pulp from those of the "mechanical" pulp, the processes, heretofore known, cannot be employed for the recovery of pulp from waste papers containing a percentage of the mechanical wood pulp, wood pulp, without their being discolored or their suitability to such an extent that it is no longer suitable for the manufacture of the same grade of paper for which it was originally used.

The object of this invention is to devise a process to recover also the fibers of this so-called mechanical because the pulp thus recovered is reduced in quality ability for use in the manufacture of the same grade of paper otherwise impaired.

Alkalis are most suitable for use as solvents in processes for the recovery of pulp from printed waste papers, but if used in solutions containing more than the equivalent of two parts of caustic soda to one thousand parts of water, or if weaker solutions are employed at a temperature of about 150 deg. F., or more, they produce the explained discoloring effect upon the mechanical wood pulp which may be contained in such waste papers. I found, by an extended course of experiments, that a solution of one, or even less than one, part of caustic soda, measured by weight, in one thousand parts of water, if employed in proportionate quantities, is, in most instances, sufficient to so diminish the adhesiveness of the oily medium of printers' ink, and of the sizing, that the pulp fibers can be readily separated therefrom, and that a solution containing less than two parts of caustic soda, or its equivalent of other alkali, does not discolor the fibers of this mechanical pulp, unless heated to more than 150 deg. F. Heating increases the intensity of the action of such a weak solution and causes it to produce, to a degree, the stated discoloring effect upon the fibers of the mechanical wood pulp.

In place of caustic soda, caustic potash may be used, and it should be noted, that one and four-tenths of caustic potash are in these respects equivalent to one part of caustic soda; otherwise all said herein, as to the use and effect of caustic soda, applies equally to caustic potash. Other alkaline solutions or compounds, as for instance, carbonate of soda and of potash, or ammonia, are effective in dissolving or saponifying the oily ingredients of printers' ink and of the sizing, but they also have a similar discoloring effect upon the fibers of the mechanical wood pulp, if used in solutions containing more than the equivalent of two parts of caustic soda to one thousand parts of water, or if a weaker solution of any of these alkalis is used hotter than 150 deg. F. Also ammonia is not as effective in discoloring the fibers of mechanical wood pulp when used diluted proportionately to the stated standard of two parts of caustic soda to one thousand parts of water. It is, however, not as certain in its effect upon the oily adhesive ingredients of printers' ink as the equivalent solutions of caustic potash or soda, or of their carbonates, and if used in a stronger solution, is apt to produce a yet darker brown discoloration of the fibers of the mechanical wood pulp.

The process of recovering pulp from printed waste papers, is best carried on, according to my invention, as follows: The waste papers are pulped in a beating engine and then conveyed to chests, provided with mechanical agitators. There is a quantity of the caustic soda solution is added thereto, so proportioned that, taking in consideration the quantity of water contained in the beaten stock, and which averages about twenty-one thousand pounds to each ton of such waste papers, there should be not more than two pounds of caustic soda, or its equivalent of some of the other alkalis, to

one thousand pounds of water. It is necessary to explain, that in the course of the process, a part of the alkali, contained in the solution, is consumed in saponifying the oily and adhesive ingredients of the ink and sludge. Taking, as a standard, a solution, containing one part of caustic soda (or its equivalent of other alkali), to one thousand parts of water, this consumption of the alkali amounts to from thirty-three to forty-one per cent., if a quantity (weight) of the solution, equal to fifteen times the weight of the paper stock treated, is used. The percentage of the consumption will be greater, if the solution is used in a smaller proportion, quantitatively, to the dry weight of the paper material is thoroughly mixed and agitated in the solution and then the liquid is drained off, the pulped stock treated. Consequently, a somewhat stronger or more concentrated solution may be employed at the start of the process, provided that it be used in a sufficient quantity—not less than fifteen times the dry weight of the paper stock—as the strength of the solution is quite rapidly diminished by the consumption of the alkali contained therein. When determining the initial strength of the solution, also the proportionate quantity of water, contained in the pulped material, when it is run out from the beating engine, on the average of about fourteen and a half times its weight, must be taken in consideration as diminishing the strength of the solution added thereto. The pulped material conveyed upon movable screens and there washed with fresh clean water, whereby the carbon or other pigments, and other impurities, are removed, all traces of the alkali eliminated therefrom and the clean pulp fibers recovered. To avoid the difficulty, if there be any, in determining the proportionate quantity of alkali to be used to produce a solution of only the requisite strength, the alkali may be dissolved in the water delivered into the beating engine and the waste papers subjected to the beating process; if this course is followed, the pulped material need not be treated again in the chests, but should be soaked in fresh water and drained, before being conveyed upon the screens. The pulp recovered from waste papers thus treated, may be conveyed to the paper making machine, or stored for future use; the fibers of the mechanical pulp contained therein are then and remain in such physical condition and color that the pulp can be used again as it was recovered, without any further treatment, in the manufacture of new paper of such a grade.

ANNUAL MEETING OF EMPIRE STATE FOREST PRODUCTS ASSOCIATION.

Special to Pulp and Paper Magazine.

Utica, N.Y., Nov. 25, 1914.

As briefly reported in the Pulp and Paper Magazine on November 15, the ninth annual meeting of the Empire State Forest Products Association was held here on Thursday of last week. Frank L. Moore was the newly elected president to succeed himself for the fifth time.

In a brilliant address President Moore dilated upon the interest of every citizen in the State in the preservation of the forests and water-powers. He said in part—

"Gentlemen, if the time is not here it is almost here, when questionable political methods for gaining public confidence will be a thing of the past. We are living in an intelligent age among intelligent people, and people who are becoming more intelligent every day, and every year, and they are going to demand above all else a constructive policy for what has been the

foundation of our prosperity, and what will bring prosperity to the generations to come—the conservation of our natural resources.

"This is the greatest problem that is before the people of this State to-day. There is much information that is being gathered now by the Conservation Commission in regard to our natural resources, particularly in regard to water storage, but we need to know more about our forests."

He went on to suggest that a thorough-going inventory of the State forests should be made by the graduates and students in the two institutions of the State having forestry education.

There must be action, according to President Moore: "The State finds millions of dollars for good roads and canals because the people want them. Why should it neglect that which is the foundation of our prosperity, particularly when that department can be made self sustaining from its own broad acres? Where necessary the watershed of our rivers should be reforested, to the end that nature may assist in the more even distribution of the water that flows down our streams.

In order that the greatest amount of moisture may be retained in the soil, every piece of land within the State, not suitable for other purposes, should be reforested. I believe that soon every board of supervisors, assisted by the State, will employ a forester to study the condition of such county and make recommendations for reforesting such portions as are suitable for that purpose. Proper laws must be enacted to carry out a project of this kind. This is just as essential for the continuous prosperity of our agricultural interests as it is to reforest the watersheds of our streams. The moisture strata in the soil must be kept as near the surface as possible, and this can only be done by a proper forest cover.

I often times think our people are slow to see the necessity of making a beginning for conserving and making self-productive our natural resources. We have but to consider the vast barren tracts of land in China, from which the tree covering has been removed, and no attempt made to reforest it, to understand what procrastination means. We have but to consider the beautiful forests of Germany, made self-sustaining through the efforts of an industrious, far-seeing people, whose government is ever ready to lend moral and financial support to its people in the furtherance of all such propositions as make for their general welfare. If this could be brought to our full realization, I believe everyone would demand immediate consideration of the suggestions I have made."

The report of the Forestry Committee was presented by the chairman, W. L. Sykes. It touched upon fire protection, slash disposal, dangers from careless campers and hunters, and workmen's compensation. The committee heartily commended the proposal to establish a forest products laboratory at Syracuse, and drew to the attention of the legislature the necessity of increased appropriation for forest purposes.

The wise cutting of timber and the proper degree of co-operation between State, public and timber owners, were warmly championed by the committee.

The usual banquet in the evening followed the day's sessions.

The officers of the Association for the forthcoming year will be:

President—Frank L. Moore, Watertown, N.Y.

Vice president—E. J. Jones, Bradford, Pa.

Secretary and Treasurer—H. J. Cadwell, Carthage, N.Y.

PULP AND PAPER NEWS

According to the returns for the Department of Lands, Forests and Mines, of Ontario for the last fiscal year just closed there has been a falling off in receipts, an amount of \$458,000 less than the estimates having come in. The chief decline has been in the revenue from timber, which was placed at \$2,000,000 and reached only \$1,698,445, a shortage of \$301,555. Lumbering from pulp wood operations were not so much affected as the cutting of railway ties, of which a comparatively small number were taken out.

S. J. Moore, of Toronto, who is president of the Pacific Burt Co., the N. F. Burt Co., the American Sales Book Co., was also President for many years of the Metropolitan Bank, which institution has just been merged with the Bank of Nova Scotia. Mr. Moore has been elected one of the new directors of the latter institution.

Another legal echo has been heard of the Imperial Pulp and Paper Mills of Sturgeon Falls, Ont., which are now part of the system of the Spanish River Pulp and Paper Co. Recently the Appellate Court, Toronto, by the value of 2,175 cords of pulp wood reduced the judgment for \$20,932.45 awarded the Quebec Bank against the Sovereign Bank by Hon. Justice Britton.

It is understood that the Ocean Falls Pulp and Paper Co., of Ocean Falls, B.C., will re-open in all branches at once as a new company known as Pacific Mills, Limited, has been incorporated with a capital of \$9,500,000 to take over the Ocean Falls Co., which has been in financial difficulties for a long time. It is said that the English shareholders, of which I. Hamilton Benn, M.P., is one of the most prominent, have consented to the new deal.

S. B. Gundy, Vice-President and Managing Director of the Kinleith Paper Mills, St. Catharines, and W. J. Gage and Co., Toronto, has returned from an extended business visit to the Coast. The company have officers in Winnipeg and Vancouver. Lieut. C. S. Patterson, who is Secretary of the Kinleith Paper Mills and Paymaster of the 19th Regiment, is among those who have enlisted with the Second Contingent, and is at present at Exhibition Park, Toronto. Mr. Patterson was presented by the staff of the Kinleith Mills with an appreciative address and Colt's revolver as a mark of esteem.

E. P. Lindsay of Boston, sales manager of the Brompton Pulp and Paper Co., of East Angus, Que., whose new newsprint mill will soon be in full operation, turning out about sixty tons per day, from the new Four-drinier, which is 160 inches wide, was in Toronto and Montreal last week on business. He reports that the company are doing a fine business in kraft paper, which appears to have a splendid demand since the war broke out.

The Daily Courier, which was launched in Toronto about a month ago has ceased publication. It has been merged with the weekly edition of that paper, which has been issued for years, and will be more liberally illustrated than ever with pictures of the war and other events of national importance.

A. F. Cayford, secretary of the Wayagamack Pulp

and Paper Co., Baptist Island, Que., was in Toronto last week calling upon the trade. He reports that the company are rushed with business, having received a number of heavy orders of late, particularly since German kraft has been shut off.

R. G. Alder, representing the widely known English paper firm of John Dickinson and Co., London, which have offices in Montreal, has arrived in Toronto, where he will open an office and look after the interest of the company, which make writing, ledgers, litho, linen face and other lines.

W. E. Stavert, President of the Spanish River Pulp and Paper Co., is at present in England arranging for a delay in the payment of the interest on the five million dollars, six per cent, first mortgage bonds of the Lake Superior Paper Co., which are largely held in England. It is said that payment of the interest will be deferred one year, and also the commencement of the sinking fund will be delayed. The three hundred thousand dollars, which will be saved for the company by the deferment of the interest, will be used as working capital, and the company will, therefore, not require any new financing. It is expected that the annual report of the Spanish River Pulp and Paper Co. will soon be published. All the plants of the company are busy.

John S. Ferguson of Toronto, who was an inspector of the northern development branch of the Lands, Forests and Mines Department of the Ontario Government, was found dead beside the Timiskaming and Northern Ontario railway tracks about eight miles from North Bay. It is believed that he fell from a train. He was fifty years of age and leaves a wife, one son and one daughter.

Recently considerable excitement was caused in Merritton by the discovery of three sticks of dynamite in a field near the sulphite mills of the Riordon Pulp and Paper Co. The dynamite was capped and fused and may have been for the purpose of wrecking the Welland Canal. An investigation is being held. Extra guards have been placed on the Welland Canal, and an old school at Thorold has been turned into winter quarters for the members of the 44th Regiment, of which about three hundred and fifty men are now doing duty. The Daughters of the 19th Regiment, St. Catharines, recently issued a patriotic number of the St. Catharines Journal, the proceeds being devoted to furnishing comforts to the men on guard along the canal.

A statement has been issued to the shareholders of the Toronto Paper Manufacturing Co. by R. S. Waldie President of the Company, covering the affairs from the beginning of the financial year—April 1st—up to the present. Mr. Waldie says in part,—"After the 15th April, it early became apparent that bad times were to be expected, and in your interest, we decided quarterly dividend of 1 1/2 per cent was paid you on the to discontinue the dividend, and notified you to this effect. Our action in that regard has since proved of great value, as it saved us from the necessity of applying for assistance to our bankers in a time of great

financial stress. Up to the beginning of the war, our operations may be described as satisfactory, in view of the conditions as they existed. The war has upset all that stability which is so necessary and desirable in business. In our own case, it has caused a marked increase in the cost of many of our important raw materials, without a corresponding increase in the price of the finished paper—this latter no doubt owing to the general slackness of orders. When you hear or read of Canadian paper mills being rushed with orders owing to the war, you must understand this to mean only those mills which make newsprint paper. One encouraging feature to be noted at this time is that we find our people are becoming alive to the necessity of using, as much as possible, goods of home manufacture, and we expect you to do your share in this regard by insisting on paper made in Canada. This company makes book and magazine paper, writing and envelope paper, litho and ledger paper; in short, the paper used in everyday affairs. Although we do not supply the printer, except through the wholesale house, yet your inquiry to him will work back to the wholesalers who buys from the mill, and so help us. Needless to say, we are conducting the affairs of this company with the strictest economy, and results for the current year to date are that we have more than earned our fixed charges; we have not borrowed any money; we have kept the mill running; we have not reduced wages, and we have not starved the plant. We, therefore, think the shareholders may regain the company's future with confidence, and our prosperity will be coincident with the prosperity of this whole country.

A charter has been granted to the Port Arthur Daily News, Limited, with headquarters in Port Arthur and a share capital of two hundred thousand dollars. The company is empowered to engage in a general printing and publishing business, and also to manufacture and deal in paper boxes and stationery. Among the incorporators are E. B. MacKay, Wm. A. Anderson and D. McD. Hogarth.

Extensive improvements have been made to the offices of George A. Howell and the Standard Paper Co., 109 George Street, Toronto. W. P. Ryrie, manager director of the Becker Co. of America, Limited, has removed his offices from 28 Wellington Street West to the new Ryrie Building, corner of Yonge and Shuter Streets, Toronto.

The Ontario Government has spent in the development of Northern Ontario during the past fiscal year \$802,578, under the direction of J. F. Whitson, Northern Ontario Commissioner, as a branch of the Ontario Department of Lands, Forests and Mines. It will be remembered that three years ago the Ontario Government made a grant of five million dollars for the improvement of the northern part of the province and already over two million dollars has been expended. The larger part of the outlay has been on road construction in the districts of Nipissing, Timiskaming, Sudbury, Algoma, Port Arthur, Fort William, Fort Frances and Rainy River. A portion of the money spent during the past year was in the construction of fire breaks.

According to an announcement made last week by Hon. W. H. Hearst, Premier of Ontario and Minister of Lands, Forests and Mines, an important step will be taken at the next session of the Ontario Legislature, when legislation will be introduced to give licenses of pulp limits the power to export, where necessary, pulp wood from Crown lands. This step will be made for various reasons, among them being

lack of employment in certain northern parts of the province, the large amount of fallen and burnt timber which would be wasted if not cut soon, etc., but it will be distinctly stipulated that the demands of Ontario mills must be met first before any pulp wood can be exported to the United States. At the last session of the Ontario Government a bill was put through throwing open pulp wood to the American market in order to clear a large amount of fallen timber, and the present move is merely an enlargement of that bill. There is not the slightest intention, however, of the province going back on the legislation passed several years ago prohibiting the export of pulpwood in its raw state across the border and the course adopted is merely a temporary expedient to prevent waste and unemployment. Every safeguard will be taken to see that Ontario plants are first provided with all the wood necessary.

Mr. Heart points out that an example is to be found in and around Port Arthur where there are no mills, but where there is considerable wood. If licensees were compelled to ship the wood to the Soo or the nearest plant they would lose all profit, whereas if they are permitted to ship it across the American border, they will provide work for the unemployed and save the timber at the same time. In the districts where the wastage is about to occur, there is hardly enough wood to warrant any manufacturer or company going to the expense of putting up a ground wood mill which would entail an outlay of several hundred thousand dollars and, before such an enterprise would be carried out a firm would have to have raw material sufficient for twenty or thirty years, which is not the case in the localities where the waste is now facing the province.

Mr. Frank A. Spear, formerly with the Abitibi Pulp and Paper Co., Iroquois Falls, Ont., as millwright, is now with the St. Lawrence Pulp and Lumber Co., at Chandler, Que.

Mr. J. G. Mayo, formerly General Manager of the Southern Paper Co., Moss Point, Miss., has gone with the Bathurst Lumber Company, Limited, Pulp and Paper Division, as office manager.

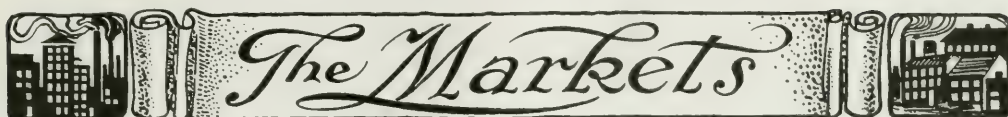
CELLULOSE DRESSINGS FOR WOUNDS.

Dressings of bleached cellulose for wounds has several advantages over cotton dressings; partly because it is cheaper and partly because it is sterile on account of the method of manufacture.

The consumption has increased and cellulose cotton is used also for other purposes than dressing wounds. It has been approved by the doctors of the Swedish army department, especially as it might be impossible under certain circumstances to import cotton. At present about 75 tons are used in Sweden under normal conditions.

Cellulose cotton was used extensively for dressing wounds in the Russo-Japanese war. It has later been widely used in Russia, and the material has been imported from Germany. This import has now been stopped and Russia has a great need of cellulose cotton, not least for its enormous armies. Common cotton seems to be difficult to obtain there in sufficient quantities.

Russia has, therefore, during the last months sent out many and urgent inquiries for cellulose cotton, or "Lignine."



The Markets

CANADIAN MARKETS

Conditions in the news print situation remain about the same as they have been and are getting more normal all the while. There is a good, firm, healthy tone to the market but the visions entertained by some manufacturers that prices would take a considerable jump at the close of the year when contracts which expire have to be renewed are not likely to materialize. It is learned that a few contracts have already been entered into at the same figure as last year. All the plants are busy and the foreign demand is keeping up well.

Shipments across the border continue to increase according to the returns tabulated and are now running about one million two hundred thousand dollars a month.

In the book and writing lines matters remain about the same and orders are rather spotty. Most of the plants are operating only five days a week but some new business has been developed by Canadian consumers, who have not been able to get supplies of ledger, heavy book, bond and other English lines asking Canadian plants to match these as closely as possible. Water conditions are not any too good and some mills, which are located on the St. Lawrence and other streams and derive their power from this source, have been compelled to shut down one or two days a week owing to low levels. It is expected that this set-back will be overcome, however, as soon as navigation closes at the end of the month or early in December. If plants were really busy, considerable loss would be represented by such shut-downs. Prices have not advanced, although the cost of materials have gone up considerably, and there is not any probability of any change in the situation until the termination of the year when new contracts for sulphite have to be made. It is not thought that sulphite producers will care to enter into any lengthy arrangements with mills until it is definitely known what the effect of foreign importations will be. The possibility of the British Admiralty closing the North Sea has made the price of sulphite more uncertain than ever. Scandinavian mills are reported to be running short of coal and sulphur and the latter, being obtained principally from Sicily, is contraband of war. There has been an easing off in prices, but a leading Canadian importer stated this week that, while consumers might now be able to get foreign supplies in any desired quantities, yet he looked for a scarcity about the first of March which would cause quotations to jump to as high as a point as they were immediately after the outbreak of hostilities. The figure for ground wood pulp is stiffening and there has been during the past few days a steadily increasing demand. Bags and toilet papers are in active requisition and mills turning out papers for papeteries and fancy stationery are enjoying a good run owing to the contemplated active trade during the holidays.

The demand for Manila and kraft papers is good and jobbers report a fair general turnover for the past month. They expect that business in their line will fall considerably during the coming month as, after the first week in December, travelers are generally

taken off the road until the Christmas season and the time is employed in stock-taking. Collections are only fair and buying is in limited quantities. There has been a rise of about ten per cent on colored board owing to the scarcity of deep colors. Prices in specialties have also considerably stiffened during the past few weeks. Mixed papers are quiet, and there has been some flurry in hard white and soft white shavings, but in other lines in the rag and paper stock arena, there is nothing of unusual interest to record.

Prices f.o.b. Toronto are:—

Quotations, f.o.b. Toronto, are:—

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in carload lots.
 News (sheets), \$2.10 to \$2.15 at mill, in carload lots.
 News (sheet), \$2.25 to \$2.75, depending on quantity.
 Book papers (carload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (carload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (carload) No. 1, \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 4½c. up.
 Sulphite bond, 6½c. to 7½c.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$4.00.
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.90 to \$4.75.
 Glazed Kraft, \$4.00 to \$5.00.

Pulp.

Ground wood pulp (at mill), \$17.00 to \$18.00.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$46 to \$47, delivered in Canada.
 Sulphite (unbleached), \$46 to \$47, delivered in United States.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$59 to \$60, delivered in United States.

Paper Stock.

No. 1 hard shavings, \$2.05 to \$2.10, Toronto.
 No. 1 soft white shavings, \$1.90.
 No. 1 mixed shavings, 55c.
 White blanks, \$1.05.
 Heavy ledger stock, \$1.50.
 Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 95c.
 No. 1 Manila envelope cuttings, \$1.20.
 No. 1 print Manillas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 30c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$5.75 to \$6.00.
 Black overall cuttings, \$1.75.
 Thirds, blues, \$1.50.
 Black linings, \$1.75.

New light flannelettes, \$5.00.
 Ordinary satinetts, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manila rope, 3 to 3 1/4.
 No. 1 burlap bagging, \$1.00.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5 1/2c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7 1/2c.
 Sulphite Bond, 6 1/2c to 8 1/2c.
 Writing Manila 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper 5 1/2c. to 7c.

Wrappings.

Grey Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 B. Manilla, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manilla, car lots, \$3.10; 5 tons, \$3.20; 2 tons \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manilla, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Bleached sulphite, \$54 to \$59 per ton.
 Kraft pulp, \$3.60 to \$4.00.
 Ground wood, No. 1, \$15 to \$16.
 Ground wood, No. 2, \$22 to \$24, delivered United States.

NEW YORK MARKETS

(Special to Pulp and Paper Magazine.)

New York, November 25, 1914.

During the interval there has been a fairly active demand for ground wood pulp, which seems to be rather scarce. Prices were firmly maintained, and showed a sharp upward trend. Shipments on outstanding orders continued regularly. Recent rains enabled some paper manufacturers operating ground wood mills to resume the running of the latter to capacity. It was reported that one large paper manufacturer was unable to make deliveries on a certain contract on account of the shortage of ground wood. Some grinders

are holding \$18.40 f.o.b. ground wood mill as the lowest possible price for any future delivery. Other quotations vary from \$17.50 to \$18.25 f.o.b. ground wood mill.

The sulphite situation has shown a tendency to ease somewhat on spot orders. Most contracts are caught up in full now, and there are some small accumulations for spot delivery. Strong unbleached is worth from \$2 to \$2.15 ex-dock New York, according to quality. Easy bleaching is firm at \$2.20 to \$2.30 ex-dock. The kraft market is essentially unchanged. Supplies are scarce. The spot market for kraft is rather weak at 2 cents to \$2.00 a pound, while contract business is firm at \$2.15, ex-dock.

There was a market weakening in the value of rags during the interval. Roofing packings fell off about 20 to 30 cents a hundred pounds for some descriptions. Other grades dropped from 1/8 to 1/2 cent a pound. Foreign rags of some descriptions are now available at prices below the contract values of a year ago. Bagging is quiet and rather weak. Old rope has been featureless as far as demand is concerned. Heavy imports weakened the value of foreign grades from 1/8 to 1/4 cent a pound. Current quotations are about 3 to 3 1/8 cents a pound.

Old waste papers were fairly firm at the early part of the interval, but showed gradual weakening toward the end. Shavings held their own fairly well at 2.50c. to 2.60c for hard white. No. 1 and 1.90c to 2.10c for soft whites. Packers reported a very stiff market in the making of contracts for the ensuing year, with binderies for shavings. They contend that the current market does not warrant the high values asked by binders. Flat stock of all kinds was a little weaker. Old magazines were quoted at 80 to 95 cents a hundredweight. Ledger stock sold at 1.65 cents a pound. The demand for old newspapers was quiet, and prices were low. Mixed papers moved along quietly with a weaker tone to prices. The range for this description was 22 to 25 cents a hundred pounds.

Pulp.

Ground Wood, No. 1, \$20 to \$25.50, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2 1/4 to 2 1/2 delivered.
 Unbleached Sulphite, impt., 2.05 to 2.25, ex dock New York.
 Bleached Sulphite, domestic, 3.35c delivered.
 Bleached Sulphite, impt., 2.85 to 3.05, ex dock, New York.
 Easy Bleaching, impt., 2.30 to 2.45 ex dock, New York.
 Unbleached sulphate, impt., 2.00 to 2.15, ex dock New York.
 Bleached sulphate, impt., 2.80c to 3.00c., ex dock, New York.
 Kraft Pulp, 2.05 to 2.15 ex dock, New York.

Quotations unchanged for all grades of paper:—

A gradually improving condition to general business was not without effect in the local paper trade. There were many events that occurred during the interval leading to a revival of confidence, and a resultant improvement to business. The opening of the Reserve Banks throughout the country was not without its effect, as a large volume of exchange was released by the operation of the new banking and currency system. The Cotton Exchange opened with a strengthening in the price of cotton. Other exchanges dealing in securities and merchandise were also re-opened after a suspension of several months, and all contributed to

ward a revival in general trade. The newsprint situation has remained essentially unchanged. Prices are very firm, and consumption on contract continues about 10 to 12 per cent. over the corresponding period of last year. Sheets and sideruns are moving along fairly well at current figures. The wrapping paper industry is fairly active, and prices are well maintained in all grades. Book statistics showed a reduction of the stocks on hand, and an increase in the shipment of stock to consumers.

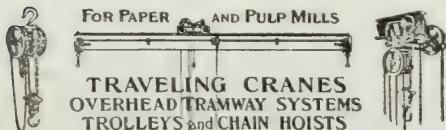
Writings, bonds and ledgers moved actively in the cheaper and manufacturers are slow with deliveries. There were several rumors to the effect that tissue had weakened considerably. There seemed to be no corroboration of these rumors, however, and prices were maintained by manufacturers despite efforts of jobbers and brokers to break the market. Boards were a little more active, and mills resumed fair running during the interval. Bags were quiet but firm in price. Specialties were fairly active at higher prices. Krafts continued to move steadily at 3½c. to 4c. a pound for No. 1. Cigarette papers were scarce, and firm in price. Manufacturers are several weeks behind in deliveries. Toilet papers and paper towels enjoyed active inquiry.

Paper.

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.30, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, superfine, 13¾c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east of the Miss. River.
 Writing paper, No. 1, fine, 9c, del. east of the Miss. River.
 Writing paper, No. 2, fine, 8c del. east of the Miss. River.
 Writing paper, engine sized, 4½c to 8c del. east of the Miss. River.
 Bond paper, 5c to 24c, delivered east of Mississippi River.
 Ledger paper, 8c to 30c, delivered east of Mississippi River.
 Linen paper, 7c to 18c, delivered east of Mississippi River.
 Manila jute, 5¼c to 5½c, delivered.
 Manila, wood, 2.75 to 3.25, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$27 per ton, delivered.
 Boxboards, straw, \$25 per ton, delivered.

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Electric Hoists

Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 47½ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York.

ST. LAWRENCE PULP & LUMBER CORPORATION Chandler, Que.

Considerable changes have recently been effected in the financial end of this firm. The interests of the Whitmer Lumber Co. having retired from this new proposition has changed the management of the plant. Mr. Racey, General Manager, will retire about the first of the year, and he will be replaced by a man associated with the new interests, whose name has not yet been given out. The pulp mill has been placed in charge of Gust. Hanson, nephew of Mr. N. K. F. Hanson of Stockholm, Sweden, a well known pulp and paper mill engineer. This company is now operating its sawmill plant, sawing about 60,000 feet per day, and has its railway plant in operation into the mill. At the present time, this plant expects to commence operation of the mill about March 1st.

This mill was designed by Mr. Hardy F. Ferguson, of New York, and built by the Aberthaw Construction Co. of Boston.

The machinery includes one large Emmerson drying machine, which is now in place, four Digesters, eight boilers equipped with automatic stokers. The company brings its wood to the mill by rail, and brings sulphur and coal by steamer, directly to the mills.

The mill is entirely reinforced concrete, and is one of the best jobs on construction, which has been carried out in pulp mills in this country.

ASSESSMENT JUDGMENT.

The Ontario Railway and Municipal Board has just given judgment in connection with the appeal of the Ontario and Minnesota Power Company against the town of Fort Frances, confirming the assessment of the town, but readjusting the figures as follows:—\$250,000 on buildings \$550,000 lands and \$480,000 business. The town increased the assessment from \$637,642 to \$1,280,000 against which the company appealed first to the district judge and then to the Railway Board, judgment being given in both cases against the company. Under an agreement with the town the assessment of this company for general municipal purposes has been fixed at \$25,000. The company owns the valuable waterpower at the point where Rainy Lake empties into Rainy River, and has constructed extensive pulp and paper mills both in Minnesota and Ontario, against which bonds have been issued for \$4,000,000. When the town assessor made a valuation of \$637,642 the company at once carried an appeal to the Court of Revision. The Court of Revision raised the figure to \$1,000,000 on the following basis: Lands \$95,000, plant \$705,000, business assessment \$200,000. The figures were confirmed by the district judge.

WRAPPED BREAD NOT IN DEMAND.

Evidently Toronto householders do not care very much for paper-wrapped bread. In the latest Health Bulletin issued by Dr. Hastings, Medical Health Officer of that city, it is asserted that the supply of paper-wrapped bread in Toronto largely exceeds the demand, and that the bakers find it left on their hands.

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VOL. XII.

MONTREAL, DECEMBER 15, 1914

No. 24

Business Outlook

The business outlook, according to the latest word from financial authorities, is steadily improving. Canadians have received over \$40,000,000 worth of war orders already. Just last week another \$5,500,000 was added in orders to the steel companies of Canada who are capable of making shells, which will be used on European battlefields. These will serve to keep the wheels of industry turning. Failing genuine progress it will at least provide temporary work for thousands of men.

Farmers are due to receive \$20,000,000 for their produce over and above what they got last year. Betterment will undoubtedly come as a reflection of better times south of the boundary, where from Boston to San Francisco United States industries report some improvement. Shipments of produce are particularly pronounced. Conditions are undoubtedly bettering. Although undergoing temporary quietness, pulp and paper makers appear to be agreed upon this point.

Technical Education for Paper-Makers

"Technical education" is the term designating the special training of persons in the arts and sciences that underlie some trade or profession. It is usual to restrict the term to the special training which helps to qualify a person to engage in some branch of productive industry.

Systems of technical education as we know them to-day arose to meet the altered conditions of production of the 19th century. Steam power was coming in, division of labor was getting down to the

point where it was at once necessary for the successful worker in most professions and industries to have a thoroughly good knowledge of underlying natural laws and the best methods of production, and it was also practically impossible for the apprentice to learn much from journeymen or masters. There was also an awakening to the absolute necessity of allowing education in its higher branches to be applied to some other than merely academic ends.

In all the Continental countries there sprang up continuation schools, night schools, and technical institutes. They filled a great need, and their influence and popularity spread through every class of society.

There has since been built up in the last quarter century a structure of technical education which is simply marvellous. The tremendous industrial advances which have been made in England, but more notably in Germany, have been largely due to the wonderful systems of training in professions and trades.

The German boy who decides upon an industrial career after receiving his primary education, may still go on in the "Fortbildungsschulen" or continuation classes, or may enter the "Fachschulen," or apprentice schools. The "technische Hochschulen," or schools of the University type, in which the education has special reference to industrial purposes, stand ready to receive those who have broad qualifications, even though insufficient to warrant a University course. Engineering is the basic study, and in these schools engineers of every description, architects, builders, and a great number of manufacturing chemists find the scientific and special training they need. In some of the larger institutions, such as that at Charlottenberg, near Berlin, ample facilities for research are given.

In Britain, technical education has gained a great hold. Even the University of London makes special provision for those who have a desire to specialize in industrial pursuits. It is being broadly recognized that to fail to bring educational facilities within the reach of every person who has the desire to use them is to stunt national development. Before the modern industrial era, education was smothered under the tradition that it was only for the "learned" men of the land. Now the tendency is to urge upon one and all the immense importance of combining a theoretical knowledge with practical experience. To quote a British authority, "The conviction has been steadily gaining ground that success in manufacturing industries, in the higher walks of commerce, and in every pursuit requiring technical knowledge upon the thorough and complete training of those who are charged with the control of the different kinds of work."

The art and business of paper making is one which will gain immensely by the introduction of technical education. Britain, France and Germany all have famous paper making schools. In the United States there has already been instituted at least one devoted exclusively to paper, and all the better technical institutions arrange for specialization in pulp and paper.

So far, in Canada, the pulp and paper industry has suffered along with almost all others from the lack of facilities for the technical education of those engaged in it. That technical education would prove an immense benefit is undeniable. The more experienced a man in the business the more clearly he realizes how small his knowledge is, the more he yearns for a clear understanding of the basic principles which govern the various physical and chemical changes which take place in his sheet as it goes from the wood room or the rag room to winding-drum. A paper chemist or engineer never ceases his investigations and experiments. Theoretical and practical go together to advance the knowledge of the fascinating process.

It is the function of schools to be a clearing house for ideas. This would be the outstanding feature of any school of paper-making which might be established in Canada. Co-operation and interchange of thoughts and experience are greatly needed. Until the time comes when an institution for the education of the boys destined to take up paper-making is required, the Canadian school will have to be among those who, already occupying positions of responsibility, believe that in co-operation the only hope of advance lies.

The question is: How can this be accomplished? What can paper makers in Canada do to improve conditions for technical education among themselves and their younger employees? A move of some kind is a great necessity.

The Pulp and Paper Magazine has been investigating this question quietly among paper makers, both those who have had training in Universities and technical institutions, and those whose training has been in the mill alone. All agree that something should be done,

but opinions vary. In order to bring the matter to a head we have asked Mr. T. Linsey Crossley, who has been interested in this matter for a number of years, to outline a plan. This will be found on a later page. Mr. Crossley submits his ideas for the purpose of arousing discussion. The Pulp and Paper Magazine extends to all readers an earnest invitation to think the matter over and write their ideas for publication in our columns. This is something in which the judgment of all is needed.

In this connection it is well to give particular prominence to the views of a pulp mill manager whose insight into these affairs is particularly deep. In a free discussion of Mr. Crossley's plan he says: "The suggestion of a travelling instructor is well worth thoroughly investigating. Upon looking into the matter, however, I think that the most likely scheme would be to institute a short course in Montreal, with the Magazine, Laboratories, Association, McGill University, instructor, and everybody else to do their part. It would not be difficult to persuade each mill to send two or three of their men for such a course, or at least allow them their time while they went. This might not be the way to gain the end, but will certainly be a good idea, on account of the fact that the Summer School idea is pretty well endorsed by the people in this country, who have heard of them in connection with teachers, engineers, farmers, etc." The writer adds that a few days spent in examination of each of the various kinds of mills—ground wood, sulphite, sulphate, soda, etc.—would have a most beneficent effect.

The question of technical education is open for discussion. We hope that our readers will write frankly and fully their views.

The Spanish River Case

The Directors of the Spanish River Pulp and Paper Co., Ltd., have issued a notice to their first mortgage bondholders that there will be a meeting in London on December 23rd to secure assent to a scheme to assist the Company from a financial hole. The scheme proposed is that the bondholders and noteholders of the three companies should agree to the funding for an average period of seven years of four half-yearly coupons—say, two years' interest. The two years' interest so funded will be increased by compound interest at six per cent per year for the seven years and the regular payment of coupons will be resumed after the lapse of the two years, the sinking fund also to be cancelled for a period not exceeding five years, and the noteholders of the Spanish River Company and Lake Superior Paper Company to agree to an extension of repayment of the principal for two years from each maturity. The funded interest will be represented by notes or certificates of the company which will be payable seven years hence with the compound interest added and will

be secured in the same manner as the coupons which they represent now are, and for which they will be exchanged. These notes the company will endeavor to issue in the form of a security which will be negotiable.

It is understood that the company had the money ready for the required purpose, but owing to the difficulties arising out of the war were unable to secure the necessary working capital to proceed with woods operations. However, they determined to safeguard the future production of the mills by securing their supply of raw material, and are now endeavoring virtually to have this course justified.

It is to be hoped that the company can make the necessary arrangements to tide them over the difficulty. It is a lamentable truth that they have a crushing load of overhead charges to carry.

The Spanish Company and the Lake Superior Company had altogether \$722,013 to pay as interest on funded debt, and other loans and proportions of discount on notes last year.

On a basis of about 400 tons of newsprint per day, or 120,000 tons per annum, a liberal estimate, the overhead cost per ton is about \$6.00.

This is a condition which disheartens all who have the pulp and paper industry at heart. The Spanish River Company has a good plant, good power, a fairly good supply of wood, and opportunities for expansion. But "finance" has injured it grievously.

Whatever may be the outcome of the present awkward situation, it should be a lesson for once and for all to the Canadian pulp and paper industry to keep good sound enterprises clear of the rocks of manipulation.

PAPER MACHINE EFFICIENCY

By JOHN W. BRASSINGTON

(Written Specially for Pulp and Paper Magazine)

Let us, in order to help point the moral of this writing, try and express the mechanical efficiency of a paper machine in terms of some definite measure, the value of which will be obvious and easily grasped by the mind. Such a measure of value for availability as a practical unit in the mill should not in any sense be a function of first cost, upkeep in repairs, labor cost, running expense, etc., it should be a measure of mechanical efficiency only. An expression covering the commercial efficiency of a machine would include in its terms not only the statement of mechanical efficiency, but also would cover the charges against such a machine for interest on first cost, insurance, average repairs, power cost, clothing, labor, lubrication and supplies; it would also cover the purchase and delivered cost of the raw material used, together with the selling price of the finished product it furnishes as output.

Let us assume that a hundred per cent paper machine would make one thousand pounds of news per inch of face of wire between decks, a twenty-four hour day under average conditions, and also that it would make five hundred pounds of book paper per inch of face of wire between decks in the same time. Such an assumption gives us at once a standard of measure and a unit of value by which we can compare different widths and makes of paper machines, one with another. The absolute veracity of such a unit as we have here adopted is not of moment, all we care for in considering its value is, whether it gives comparative values of real use between any two of any number of machines. It is evident that as long as the kind of paper being made is the same on any two machines, that this method of comparing the outputs of the two is just and fair, giving a true balance of efficiency between such two machines. Such a comparison covers all contingencies, such as relative speed, amount of broke, condition of machine, capacity of dryers, regularity of drive, shake indicator diagram, etc., etc.

Any great disparity between two given machines in mechanical efficiency as expressed in this manner would indicate serious trouble in one or more of the governing causes, partially listed above, in the case of the poorer machine. There are paper machines in operation at the present, both book and news, giving an average efficiency factor of 70 per cent and over; quite recently a paper machine survey and report, made by efficiency engineers, resulted, when the suggested improvements were made, in a jump of efficiency from 48 per cent to 72 per cent.

A prominent firm has been so encouraged by the satisfaction given their customers and expressed by them as resulting from paper machine surveys, that they now offer to make a report based on careful observations, made by competent men, with instruments of precision on any paper machine now in place. The object of such a report being to indicate to the owner of the machine the correct changes to make, in order to increase the efficiency of the machine.

It is probable that any paper machine now in operation is susceptible of improvement in efficiency, and would respond very promptly to treatment based on a diagnosis, made by a careful survey. Paper machine efficiency engineers, when invited to do so, visit a mill with the sole object of studying the feasibility of increasing the output and quality of product of the paper machines in that mill. It does not matter who built the paper machines; all machines may be benefited by such an investigation, and its resulting applied improvements. None of the older paper machines should be allowed to remain in the the well worn ruts of the years that have gone by, and be expected to compete with younger and improved rivals, the difference in efficiency is too great.

Paper machine efficiency engineers attribute the larger part of their success in every case in the past to the whole hearted support of the personnel of the mill; it is the combination of the intimate knowledge of the

mill force with actual working conditions, together with the experience such investigators have gained in other and similar cases that accomplishes the major portion of the work. The small remainder of the survey is, however, almost as important; it is, so to speak, the Keystone of the Arch; this is the careful record of the physical conditions maintained in and about the paper machine under construction. Instruments of precision are used for this purpose, curious in appearance and interesting in construction, they are almost infallible in pointing the way to better things, when the records they each furnish are tabulated with one

every dryer, of steam header and of water header; Pressures in steam header, in water header and dryers; Weights on couch arms, press arms, location of same and resultant pressure per inch of face of rolls; Inclination of wire, size, spacing and diameter of table rolls; Description of furnish, percentage of water in paper at couch, pressers, dryers, and calenders; Indicators cards from shake—type and periodicity; Head on slices; Suction box data; Speeds of peripheries of all rolls, direction draw and lead of paper; Condition of drive, power required for same,



PART OF A PAPER MACHINE TESTING OUTFIT.

another, and a mental composite picture of all conditions is so fashioned.

Let us go into the machine room and observe those two engineers making observations, glancing as we go by at the blank report forms one of them has pinned to a small drawing board, preparatory to transferring to them a fair copy of the notes each is making, as they take periodical readings of the instruments they are now using. Here are some of the readings.

Temperature of air inside machine room, and outside. Humidity of atmosphere at the different parts of the machine and outside the building, direction of air currents. Temperature of

causes, if any, of useless power absorption; Strains on wires, felts on presses, uniformity of stress in dryer felts, conditions of stretchers for clothing at time of observations; Average life of clothing; Strength, weight, finish and quality of paper; Present efficiency, possible efficiency, recommendations.

Here is a ventilation chart; there a tabulation of the diameters, eccentricity and noticeable temperature indications of local troubles all concerning the dryers, type of traps, joints, and steam consumption, etc.

We show cuts made from photographs of some of the instruments.

Let us follow our friends down the machine, they are taking readings of the speeds, and listen to their conversation:—

"Breast roll 18in. diameter. 174 feet per minute."

"Couch roll 18in. diameter. 174 feet per minute."

"1st press roll, lower, 18in. diameter; 175 feet per minute."

"Better try that again, that does not sound fast enough. This is a suction couch roll you know."—A slight pause—"175 feet, that's right," confirms the man with the instrument.

"2nd press roll 18in. diameter, 177 feet per minute."

"Slow, again; are you certain?"

"Yep! No weights on the levers on tending side, small weight on short arm on driving side."

"How is she working? Crown look right?" etc., etc.

Later on we find our two investigators making notes of say the temperature of the dryers.

"Pressure gauge is out of order, reads too high."

Steam header 212 deg., wonder they don't cover that."

A pause. "3rd dryer, 10 deg. F. coated with fluff."

"Steam joints too tight and leaking, water in dryer."

"Poor lead of paper, flaps badly one inch off centre."

"Wet felt."

"Is that tightener traveller stuck?"

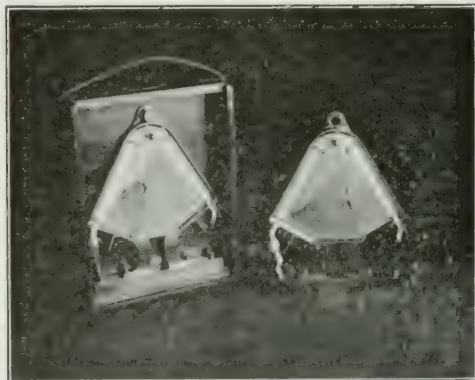
These remarks are disconnected, not to say enigmatic, yet it seems to bring the reader nearer the facts than to put them down for his information. It is nothing unusual for such a survey as we have partially outlined to take ten days or two weeks, and then some days more before the different data can be correlated and a valuable opinion given. Sometimes it is an elevating device on the Fourdrinier, again a readjustment of table rolls, here a proper relationship between crown, weights and rubber covering, there a smoothing press, here more dryers or a different steam distribution, again the loss of efficiency may be due to lack of balance of the rolls, or even in cases to improper stresses on felts; often poor ventilation takes its toll from the possible efficiency of the machine.

In short, this survey work is worth while, its exponents are invariably enthusiastic and as they gather experience, are themselves becoming more efficient. This natural development of the efforts of all mills to improve efficiency is thus rapidly crystallizing into a real way to gather and use the information that has so long escaped our notice in the good old days of large profits and careless indifference to details.

As for results taking into account the cost of expenses in some cases to the best of the writer's knowledge and belief, these are approximately the facts. By spending all the way from five to ten per cent of the first cost of the machine, the efficiency has been improved say from 50 per cent to 70 per cent; this means a total maximum increase of production of 40 per cent. The paper mill manager who recently stated that paper machines can be run too fast, is absolutely right, but it is a pity to apply his remarks as though they referred only to the paper machine. The paper machine, as the final production unit of a paper mill is naturally the epitome of that mill's efficiency and its speed of production should be always timed to the speed of production of the mill which is synonymous with the mill's greatest efficiency.

During a period of four or five years, the writer was personally engaged in and had full charge of a systematic investigation of mill economy, during which time innumerable tests were made, periodical

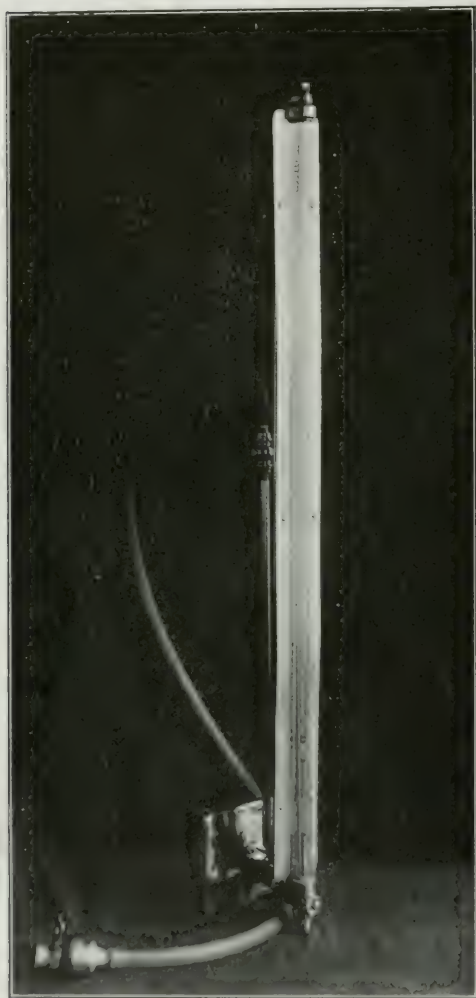
reports based on the results of these regularly recorded and monthly balance and cost sheets tabulated therefrom. It is not long, a matter of about ten months or a year, before this study of economic output and cost of production begin to show clearly that in any mill, manufacturing any standard product, there is a definite point in the production curve that is the peak of economical production for that mill. The standard of economical production is, of course, the composite result of the efficiencies of the many smaller units that each contributes its share in the total results; the efficiencies of these smaller shares cannot but vary as each of the smaller units becomes run down by want of proper upkeep, or is furnished up by expensive replacements and repairs. On the whole, however, providing no great changes in layout and machinery are undertaken, the maximum productive capacity giving the maximum economy in cost of manufacture per unit of product or per thousand of yield of any given mill, will remain practically constant. It should be the object of the competent mill manager either to know and stick to this actual economical maximum of product per unit of time, or else find out where to spend money and effort in order to increase this capacity thus economically limited by actual conditions.



TWO HYCRODEIKS.

In case the thought here submitted as a fact is not absolutely clear, let us imagine a suppositious case. Suppose we have any mill turning out so many thousands of pounds of product every day at an actual cost of say \$15.00 a thousand pounds, of which we assume \$5.00 represents raw material which is practically a constant charge outside of market variations. There is also a charge here included in the \$15.00 that is constant in actual quantity yet variable when stated as a percentage of cost per unit of production; that is the charge that consists of interest in investment, insurance, constant salaries, etc. etc.; this for the sake of this argument (and in no sense is the figure assumed to be proportionately accurate) we will take as varying from \$3.00 to \$4.00 per thousand of yield, the more the plant turns out per day, the less this charge per unit of product will be as far as this expense goes, the more product the better. This is such an obvious fact that even the most stupid of managers grasp it firmly and it becomes an accepted theory by

those who have no knowledge except the advice offered by such a manager. Now and then one of the more brassy men speaks openly as one has done in this case, and says that there is a point where the fact of turning out over a certain amount of product per day does increase the cost per thousand, so much that it is no longer profitable to run the mill at the increased rate.



DIFFERENTIAL MERCURY GAGE FOR DRYER PRESSURE.

To return to our figures, we have now left of our \$15.00 from \$6.00 to \$7.00 per thousand of yield that goes to supplies, repairs, wages, etc. These figures are made up of smaller sums paid in many directions, but one great truth covers all of them, and that is "when you overwork a man or a machine, you either produce an inferior product per unit of time or increase cost of product per unit of time." Overload

your boilers, your fuel cost goes up; overload your engines, your steam consumption per unit of power mounts skywards; increase the output of your beaters, the stock loses strength, and the quality deteriorates; give your man too much to look after, he must neglect to a certain extent some more or less vital detail.

So in the aggregate, as in the segregate, there is always a point of operation beyond which quality begins to deteriorate, and cost to increase far more rapidly than the value of the increased product. This point, on the curve of production, which is the point of maximum economy of a paper mill, is often far below the possible capacity of the paper machine or machines that, so to speak, in themselves epitomize the whole work of the mill in that they complete all of it. Sometimes the weakness of the support given to the paper machine by the mill is caused by the above hastily sketched causes only, and sometimes the boundary line between maximum economy and actual loss is abruptly crossed by the apparent necessity to use say more sulphite in the stuff in order to maintain a given speed on the machine, because the paper machine itself is inefficient.

When a mill is run say 20 per cent above its economical capacity, the deterioration of its machinery is rapid, and more immediately noticeable still, the labor, power and supply, and waste cost per thousand of yield advances rapidly; the \$6.00 to \$7.00 per thousand for these items soon becomes a \$10.00 to \$12.00 charge, and profits automatically disappear; the fact of this loss is often overlooked owing to old-fashioned book-keeping methods, is not always evident until it is too late to retrench and meanwhile contracts are made and obligations incurred that mean serious loss.

Two mills may be designed as practically duplicates by the same engineer, and yet the economical capacity per diem of one mill may exceed the other by 25 per cent; this point of maximum economical capacity depends on the machinery, layout, and personnel of the mill, and is within limits a very definite figure characteristic of each mill, and on the knowledge or ignorance of its value and existence may depend the commercial success of the mill.

To summarize conditions in a mill or in any mechanical operation, by stating it is not an economical thing to increase the efficiency of any machine in operation in that mill or operation, is to state the half truth that is more deadly than many absolute misstatements. It is evident that the strength of a chain is measured by the strength of the weakest link, but it is erroneous to throw away the stronger links because their extra strength is not needed; it is better to inquire carefully into the conditions of each link and try to strengthen all, until each is equal to the strongest, then the maximum work can be accomplished without extra strength being anywhere unused and unprofitable.

The obvious lesson we can draw from our thoughts on such a problem as this is that there are possibilities of economy in operation and production hidden in every mill and manufacturing establishment that will amply repay a properly organized effort to find them. This is one way to find them—1. Ascertain the cost per unit of yield for every operation; (2) Compare the sum of the ascertained costs per unit of yield of all operations with the actual total cost; (3) Determine the leaks and losses; 4. Find an expression for efficiency for every operation, and try to improve this efficiency in each case, this is comparatively easy

when you have obtained a clear view of the cost of the component parts of each operation; (5) spend your money on the weak spots when you know them. The aggregate result of such a systematic investiga-

places; but no engine or machine can be good enough, efficient enough or fast enough, within mechanical and structural limits for some other conditions of service; it is always well to be sure that the engine

DATE		TIME		PAPER MACHINE TEST DATA				ENGINEER				FORM - 1	
NAME OF MACHINE OWNER -						LOCATION							
MAKE OF MACHINE				CONT. NO.		DRAWING NO.							
DESCRIPTION OF MACHINE -													
TEMPERATURE - OUTSIDE				KIND OF PAPER				FURNISH		WATER AT FLOW BOX			
" - MACHINE ROOM				SPEED " " PER MIN.									
STEAM PRESSURE - EXHAUST													
" - LIVE STEAM													
ROLL	DIA. x FACE	SPEED PER MIN.	TEMP. DEG. F.	HYGRIETER HUMIDITY		% MOISTURE IN PAPER	WT. ON LEVER TUNG. SIDE		WT. ON LEVER DRIV'G. SIDE		GENERAL REMARKS - such as Crowning-Pressure per in. face-Appearance of paper- Direction due to pressure conditions - Drawing.		
				WET	DRY		WT.	LEV. ARM	WT.	LEV. ARM			
BREAST													
U. COUCH													
L. COUCH													
U. 1 PRESS													
L. 1 PRESS													
U. 2 PRESS													
L. 2 PRESS													
U. 3 PRESS													
L. 3 PRESS													
SWG. PRESS													
1 DRYER													
VID. "													
LAST "													
CAL'D'RS.													

Form Used in Making Test on Paper Machine

tion is that the point of maximum economic capacity will soon catch up with the strongest unit of manufacture, even if that is a fast running machine.

In conclusion, it is well to note that any engine or machine may be too good, efficient or fast for some

or machine is designed for and is still in condition to faithfully perform the duty required of it, and every Tom, Dick and Harry cannot pass a reliable opinion in a matter of this importance; the problem should be carefully studied in every detail.

ASSESSMENT RAISED.

The Ontario and Minnesota Power Company has lost an appeal before the Ontario and Municipal Board. The fixed assessment for municipal purposes is \$25,000. When the town assessor, on the basis of the extensive waterpower and other holdings made a valuation of

\$637,642, the company appealed to the Court of Revision, which body raised the figure to \$1,000,000. The Provincial Board, on the appeal of the company held a direct investigation, and so far from reducing the assessment fixed it at \$1,280,000. There can be no appeal.

TECHNICAL EDUCATION IN PAPERMAKING

By T. LINSEY CROSSLEY

(Written Specially for Pulp and Paper Magazine)

The Canadian Paper Trade, whose future has seemed to be assured by considerations of cheap power and vast supplies of raw materials, now finds an element of added promise in the crippled condition of trade that will most certainly be found in European centres for a long time to come. While of course the last consideration is devoutly to be regretted, it presents us with a potentially great opportunity for expansion.

If there are "such things to be," we must be prepared not only with power, raw materials and capital but with workers to face intelligently the need for adding technical proficiency as a quality factor to the three quantity factors mentioned.

How can we make a rapid growth in proficiency to meet these conditions?

We had a Swedish foreman in the pulp mill who said "something must be done suddenly," when a twelve inch beam gave way under the chip bin. We cannot work quite so suddenly in technical education.

We can, however, realize that it is education—at least as much as induction that we are looking for. It would take at least a year under the most favorable conditions to open a school building and another three to five years before students could be trained and placed in mills and they would have practically no mill experience. In the suggestions that follow the main idea is that men now engaged in mills, co-operate for their mutual education.

For the last five years the writer has been endeavoring to arouse interest in some form of technical education for paper and pulp mill workers. He has approached pulp and paper mill men, technical schools and the Premier of this Province. The questions raised in these conversations could be grouped into three main propositions. First, what would be the composition of the student body in any proposed school of paper technology? Second what would be the nature of the instruction? Thirdly, how could such a project be financed and housed?

Taking up the first proposition: The classes of men who would be benefitted by knowledge of paper technology would be

- (1) Clerical or Commercial Managers,
Salesmen,
Purchasing Agents,
Stenographers.

It would be safe to say that many of the men acting in these capacities have not sufficient technical equipment. This is evident to any one who has corresponded with salesmen and managers with reference to such details as inquiry tests or who has observed the handling of purchasing agents by skilled salesmen of supply houses, or dictated a letter containing the technical terms of the industry.

- (2) Supervisory or Constructive Superintendents,
Foremen,
Engineers,
Millwrights.

- (3) Practical or Operative Machine Tenders,
Beater Men,
Acid Plant Workers
Cooks,
Sizemen,
Bleachers,
Calendermen,
Cutters and Packers.

Now we come to the second proposition, the organization. It will be seen at once that the ideal practical school would need at least one specialist in each of the departments indicated by the above indications. Some way by which men in these various occupations could be co-ordinated into an efficient technical team for mutual supply and support would have to be devised for the curriculum of such a school. The beater-man should not put in time trying to grasp the details of salesmanship, but should appreciate the important relationship he bears to the sales department in a careful study of cause and effect.

The purchasing agent should know when and how to enlist the help of the chemist and he in turn should know, besides his analytical functions, something of engineering and of market conditions.

The third proposition as to financing and housing such a school was usually considered such a problem that the discussion terminated then and there. Manufacturers, rather short-sightedly said: "The government should pay" and the government, at least in one instance said: "The government will put up a share if the manufacturers make the first move."

It has been objected that such a school would only have a limited function in the training of men with a view to their taking up work in the paper industry. Men actually at work in mills, often in places a great distance from any other mills could not give the time or afford the money to go to a central school especially in a country such as Canada whose industries are not centered in any particular districts.

When the writer spoke of this question to Mr. J. R. Booth, his reply was brief, characteristic and contained the truth in a sentence, "The mill is the school for papermakers." This does not cut out the research idea of such places as the Canadian Forest Products Laboratory or the the magnificent work of the American Forest Products Laboratory at Madison. These places fulfill their functions however only under the eyes of skilled observers whose experiments must often be of a nature rather disturbing than helpful to pupils.

The writer believes that a means of carrying on some form of instruction can be evolved to include all the operatives of the pulp and paper industry and many of those whose business is more or less dependent on paper such as printers, lithographers, inkmakers, stationers, bookbinders, etc.

There are now three institutions in Canada that make an elastic educational arrangement possible. These are

- (1) The Canadian Pulp and Paper Magazine.
- (2) The Forest Products Laboratory.
- (3) The Canadian Pulp and Paper Association.

The idea would be, roughly, to form a sort of "clearing house" system of instruction with the Pulp and Paper Magazine as the medium, the Forest Products Laboratory as the reference library and the Pulp and Paper Association as the source of authority and financing agent.

It is suggested that the Magazine open a department of technical education and that students be enrolled at first by the act of subscription to the magazine. In many cases employers would be willing to pay this subscription for their men. The student being actually engaged in the commercial operation he is studying would have illustrations continually before him which could not be carried on in any school. His problems could be taken up with him by the instructor with comment by his fellow students.

The students would be enrolled and classified as of their various departments each department to constitute a class; from managers or superintendents down, and a student might be a member of several classes. For example a beaterman might be in classes for sizemaking and machine tending as well as beating. The text book of each class would consist of an edited reprint of the literature bearing on that special point. The students could place problems or their solutions of problems before their fellow students, so that each would get the benefit of the work of all.

This may sound uncommercial to some manufacturers of the older school who do not believe in publicity, but team play is the watchword of today in industry. A wide open policy that leads to the increased consumption and wider use of a manufactured article is more scientific and for all concerned more profitable than the secret rule of thumb method. This often ties a large factory to the whims of an ignorant but fortunate operative who receives a big wage because he or his father has stumbled on some kink which now and then turns out an improved or increased yield. He doesn't know the reason and is helpless in the face of failure. These men talk knowingly of the "difference between theory and practice" and waste tons of material when some uncontrolled factor upsets their method.

A study of causes under proper control and by exchange of experience with others engaged in the same kind of work would soon standardize the special effort for the benefit of all and no one more benefitted than the deviser of any idea. An immense amount of more or less skilled observation is entirely lost by non-record of interesting occurrences in mills. The writer suggests that a start could be made by opening a department of technology in the Pulp and Paper Magazine to which questions arising in the various departments of mill work might be sent. These questions would be published and discussion invited for the next issue. In the meantime the instructor would also prepare a discussion of the points raised. In this way the experience of a man in British Columbia might help his fellow worker in Quebec. This work, properly attended to, would soon develop into a larger work. To give the work a start each mill could arrange to give a subscription to the Pulp and Paper Magazine to any of its men who would enroll as students and promise to undertake a reply to any questions that came into the class or classes in which he was enrolled. The mill could help by having his replies typewritten for him. If this work were taken up in the right spirit,

even by a few, it could not fail to place in scientific hands for filing, a lot of very valuable information besides leading the men away from their present isolation in unit mills to a broader conception of the industry they are engaged in.

We will suppose a man has joined a class. He would be given a number and filing card. His record card would read something like this:

No. 140	John Williamson, Oyster Bay Paper Co.
Beaterman	Attended school at Oyster Bay, Ont.
Bleacher	Started High School but only 1 year.
	School Record
Submitted Problem No. 443—	offered no solution.
Note—	Question—reasonable—well thought out.
	Answers received from Nos. 123 127 152.
	Answered Problem No. 592—submitted by No. 163
Note—	Answer showed correct ideas and good grasp of subject.
	Other communications Numbers 408 524—712
Examinations—	Passed examination in Beating with high standing, but did not do as good work in examination on bleaching.

Such an institution would not need installation of expensive machinery with a staff of mechanics to run it and requiring large floor space. Instead, a desk, a typewriter, a good filing system and an instructor of practical and scientific experience would be all the equipment necessary for a long time and this could be extended very simply by additions of the same kind, more files, more typewriters.

If the industry as a whole responded in good numbers a very small fee would cover all the expenses.

Later an itinerary of lectures could be arranged so that the various students in any mill could meet and hear a lecture or series of lectures on the industry in general and discuss with the lecturer their own special work. The writer offers these suggestions in the hope that they may inspire action that will lead to a start being made with technical education in the paper and pulp industry of Canada.

TRADE INQUIRIES.

Upon quoting numbers below, Canadian manufacturers may obtain particulars regarding the following trade enquiries made to the Department of Trade and Commerce at Ottawa:—

1168. **Wood Pulp.**—A Glasgow firm desires the addresses of Canadian manufacturers of wood pulp who are in a position to quote for prompt shipment.

1170. **Papers.**—An English firm manufacturing cigarette papers, bible papers, copying, manifolds and typewriting papers, wishes to get into touch with Canadian importers.

1190. **Pulpwood Poles.**—A Welsh manufacturing company invites quotations from Canadian firms who can supply pulpwood poles 4 in. to 12 in. top and in lengths of 9 to 12 feet barked and partly basted), suitable for conversion into wood fibre for packing purposes.

1199. **Paper.**—A London firm who are buyers of various kinds of paper, and especially of news, invites offers from Canadian manufacturers.

LEDGER AND ACCOUNT BOOK PAPERS

By HARRY A. MADDOX

(Written Specially for Pulp and Paper Magazine)

Ledger paper ranks among the most important products of the papermaker and the ease of the finest grades represents one of the most remarkable achievements in the world of paper. The importance of the stock makes it necessary to devote persistent consideration to the principles which must always guide its manufacture. To this end, therefore, the following matter will purport.

The essential factors are, durability of material and physical character, the latter including ink resistance, erasure, surface colour, strength, finish, etc. Sundry other features of only slightly less importance are the watermark, sorting, counting, packing, etc.

The development of loose leaf ledger systems has created a distinct incentive for new ideas in paper-making, mainly in the direction of strength, colour, texture and character of wiremark. It has become realized more and more that strength to an extreme degree, combined with the maximum of durability, is an absolutely essential feature in ledger paper of grade number one. Formerly, almost every type of ledger paper was run under a laid dandy, a matter for which no efficient reason can be assigned. Wove papers are more suitable in every way for ledger stock and it may be desirable to devote a little consideration to this phase of our subject. In the first place, wove texture presents an improved appearance; it also introduces an equally distributed and improved strength by reason of the absence of the thin ridges which are characteristic of the laid mark. The laid wire dandy imparts what is really a watermark, consisting of thinned and thickened portions in the paper. In testing a paper for strength it is an axiom that watermark portions must be avoided, but on a laid paper it is manifestly impossible to avoid the markings. The maximum of strength from the same stuff is secured by running the wove dandy. Continuing further, it may be claimed that the surface of wove paper presents a more even and responsive pen-writing area than if it were undulating with laid marks. Certainly it presents a much better opportunity for unbroken ruling and printing, as any practical stationer will readily admit. Add to this that the wove dandy closes the web better, thus enabling a closer texture to be obtained, and it would appear that we have sufficient reason for a further development in the use of the wove dandy on ledger and account book stock.

Watermarking is a branch of the art of papermaking which has not received sufficient attention from a commonsense point of view. Massive marks, embodying incongruous devices and lettering of unwieldy proportions, have almost become established, to the detriment of the paper itself. It is perhaps advisable under these conditions to consider the true purpose of a watermark. In the first place it is a brand of quality, secondly it is an advertising agent whose purpose is to secure repeat and enhanced orders for the same quality. Certain types of standard watermarks are applied to the several sizes of account book paper as a derivation from old customs. Although this habit as on the wane, it is still largely practised, particularly on English papers. In a sense the marks are useful but not sufficiently so to counteract their

disadvantages. To the papermaker or the user of the ultimate book they are of no earthly use or value, while if the stationer knows his business there is no necessity to point out the size of a sheet by means of an incongruous traditional service. The present position of the watermark, with few exceptions, is the centre of the sheets. In our opinion that position is ugly and useless; further it is a distinct hindrance to the paper-ruler, while the argument may also be put forward that it weakens the sheet to an appreciable extent. A watermark will serve its purpose equally well, better in fact by being small, certainly also, it will aid toward uniformity and beauty in the sheet. The first essential then, toward successful and up-to-date watermarking is that the device, or name, or both, should be small. At the same time, it should also be distinct, preferably of the fine outline variety. Having attained the desired diminution in size, we may next proceed to a perusal of position. The worst place for a watermark is along the middle of the sheet, yet as we have already observed that is precisely where most of them appear. A short examination of the watermarks in written up account books, or in printed volumes will conclusively prove the extreme difficulty which attends the effort to decipher a large watermark in this position. All ruled and printed books have a wider margin of blank space at the foot than elsewhere. This in itself points the way to correct opposition of the watermark. It may run twice along the foot in order to fall on every leaf or folio. The small amount of trimming which accompanies the manufacture of standard size account books could be readily allowed for. Coincident with this approved position of the mark, the work of the ruler and printer is aided considerably and better results are ensured. A deeply impressed device in the middle of a sheet will hopelessly break up the contour of either a fine ruled or printed line. It should be borne in mind by the papermaker that the ruler's pens ride very delicately over the surface of the sheets, therefore at every depression a broken line is inevitable.

While on the subject of watermarks a word or two may profitably be said concerning wiremarks. These refer to the wirepores so common on the underside of both wove and laid machine papers. At all costs these should be eliminated on high grade ledger stock. It is a common complaint of the ledger clerk that he encounters considerable difficulty in writing on the wrong side of the paper. It is vastly annoying, after running smoothly over a full page to turn over leaf and engage a page exhibiting a distinctly different character to the first. Much may be done during manufacture to eliminate wire pores. In the first place the pulp should be well beaten; then avoid an unduly severe wire shake at the wet-end. Work a suction couch roll if possible, or at least control the style of jacket and amount of pressure to reduce the danger of maintaining a wiremark. The web must not bear any trace of the wire pattern after passing the press rolls, for little help can be expected at the finishing end, in fact the damping and tubsizing are more likely to open out the mesh than otherwise. Naturally, we do not expect nor desire to remove the appear-

ance of a woven wire so far as the look-through of the paper is concerned, our remarks apply merely to the porous state of the wireside of many makes of ledger paper.

The question of even-sidedness in color is vitally combined with the foregoing proposition of eliminating wire-marks, for the treatment that rids the latter perfects the former. In the control of color in ledger stock, among others, two things need to be considered, the specific gravity of the color and the influence of suction on the web. Smalts is a notably heavy mineral color, with ultramarine a distant second. Papers dyed with smalts are notable for the dark color of the underside, particularly in the case of hand-mades. There is neither use nor beauty in a ledger paper which approximates to a duplex tinted in the matter of coloring. As far as possible this effect must be overcome. Much may be done by using well beaten pulp, which settles slowly on the wire and retains the color well on the surface. At the same time it is of no use to employ correctly beaten stuff unless it is kept well mixed in the stuff-chest, and en route for machine. A good mixing device which will keep the particles of colors in adequate suspension is a necessity where smalts and ultramarine constitute the dye. At the wire, the water must be allowed to carry on for a sufficient distance in order to impart strength and a slow and steady settling. The suction rolls and pumps must work lightly to accommodate this process, as a big pull at the suction boxes irretrievably sets the wire mark and draws the color to the underside.

With the attainment of even-sidedness in coloring, there still remains much to be said. The type of dyestuff used for toning any particular grade of azure or blue stock is an item of information usually known only to the papermaker himself or the chemist who decides to make an analysis. It would be a decided advantage to the stationery trade and to particular users, if the grade or type of dyestuff were devoted on the stock wrapper or on the sample sets. It is often important that paper for certain purposes must be dyed with a material immune from attack. For example, paper for permanent record journals, which would require to be stored or used in an acid atmosphere would not be satisfactory if dyed with second-rate ultramarine. Under present conditions, neither the stationer nor his client is aware of the nature of the dye with which the stock is colored. As a consequence, it is only when the damage is done that the importance of determining the dye is recognized. Some rules should be defined by papermakers and buyers with a view to setting down regulating standards for ledger papers.

We would suggest that for grade I., papers suitable for permanent records, state documents and forms, books, etc., and for blued stock that must be fast to every likely atmospheric reagent, smalts alone should be used and that only of the best quality. Every precaution should be taken to prevent a speckled appearance due to the many gritty and over-sized particles characteristic of poor grades of smalts.

For grade II., books of secondary importance and those not likely to encounter severe fumes, an almost permanent coloring would be ensured by using a mixture of smalts and good ultramarine of good quality.

For grade III., where absolute fastness may be subservient to brilliance of tone, pure ultramarine alone will provide everything desirable. Such a paper should be absolutely free from acid traces and contain but the

minimum of alum, whether from the preliminary resin or ultimate tub size.

Smalts, is an unfading blue of low tinting power and embodies in its composition silica, potassium and cobalt glass, or chemically as a potassic cobalt silicate. Smalts may embody up to 67 per cent of silica, whereas ultramarine does not hold above 42 per cent in the best grades.

Ultramarine is a double silicate of aluminium and sodium, together with bisulphide of sodium. The best grades are rich in silica and the value of the color for fastness may be judged partly by this content. During manufacture, and especially at the drying end, ultramarine is submissive to the effect of alum embodied in the pulp, but the interaction practically ceases when the paper is closely packed and not exposed to light, heat or damp, provided that there is not present a considerable excess of alum or acidity. In the drying process, air or loft drying methods provide much less likelihood of deterioration in color, a disaster which is often due to sudden and strong heating at the cylinders.

To briefly restate the case, smalts should be used for highest grades of permanent ledger paper as also for important records in chemical manufactories, and other places where fumes are prevalent. Ultramarine would soon display its susceptibility to acid fumes and would in time totally disappear. The reasoning of permanent color applies with equal force to the choice of ruling, printing and writing inks, perhaps even more vitally than to the paper dyestuff, for bleaching or fading of the latter would not be likely to affect the written or printed record. It may be presumed, however, that the effect of the action carried on in situ during the progress of color deterioration might influence the character of the paper itself in some degree.

Where there is no probability of destructive chemical influence on the paper, as in professional offices, ultramarine or indanthrene coloring would be efficient, but the former is preferable by virtue of the purer tone of color imparted.

There is much more to be said on the subject of ledger paper, but sufficient space has been taken for the time. We hope to devote further consideration very shortly.

QUANTITATIVE DETERMINATION OF ROSIN IN PAPER.

Special translation from "Papirjournalin.")

Five grams of paper, cut in strips of 1 to 4.5 centimetres, one folded and extracted in a Soxhlet apparatus on water bath with an acid alcoholic liquor, consisting of 100 cc. alcohol 95 per cent + 15 cc. water, which contains 5 cc. glacial acetic acid in every 100 cc. The liquor is run over 6 to 12 times, depending upon the quality of the paper, and afterward evaporated in a beater, until only a few cc. remain. After cooling 25 cc. ether are added and the liquor is shaken in a 300 cc. separating funnel with 150 cc. water, containing a little NaCl to prevent the formation of an emulsion from the size contained in the paper; the ether is separated off and the liquor remaining again shaken out with 25 cc. ether. The two ether extracts are mixed and washed twice by shaking with distilled water in order to eliminate any salts, if present, as well as other substances. The ether solution is evaporated to dryness in a platinum dish and is then left for exactly one hour in water drying box at 98 deg.—100 deg. C. and weighed.

ONTARIO WORKMAN'S COMPENSATION ACT

An Impartial Analysis.

By N. A. KEYS, B.A.

It bears no small testimony to the interest which this subject has evoked, and is evoking, that you, tired after your day's work in the shop, are willing to be here in such large numbers to participate in a discussion of the new Ontario Workmen's Compensation Act. This Act is probably the most important legislation which the Ontario Government has ever enacted. The subject of workmen's compensation is an unusually difficult one involving as it does, social, economic, legal and actuarial technicalities. One who has given the subject much study, therefore, is very apt to lose sight of the forest in the examination of the trees. I must ask your indulgence if I should infringe in this respect.

Workmen's compensation may be defined as the method of paying insurance to workmen for accidents which occur to them in the course of their industrial employment. In dealing with the subject it will be my endeavor, first, to review briefly the present law, secondly to explain the essential features of the new Workmen's Compensation Act, particularly those which are of significance to you, thirdly to deal briefly with the question of accident prevention, a question which is just as important, if not more so, than the compensation of workmen itself.

Damages Under the Old Law.

At common law a workman is only entitled to receive damages from his employer if he can prove that the latter was negligent. In the course of time the employer became possessed of three defences which cut down very materially the workman's chances of securing a verdict. The first of these was that of contributory negligence; a second defence was that of common employment. The employer, if he could prove that Tom Jones had been injured through John Brown, a fellow servant, was entitled to receive a verdict in his favor. A third defence which is very vague of definition, and left open the door very wide for a clever lawyer, was that of inherent risk. In this defence the employer put in the plea that the accident was due entirely to an inherent risk in his industry, a risk of which the workman was aware when he entered the employer's employ. Well, under this state of the law the workman, as you can readily see, would recover damages in very few cases. I think the actual percentage of cases in which a workman did receive a verdict in his favor was about sixteen per cent.

The large growth of the population in recent years, the rapid march of invention and the vast organization of industry has rendered some more equitable method of compensating workmen imperative.

The former system of compensating workmen was extremely wasteful. Statistics show that of every dollar the workman paid in insurance only 25 cents ultimately reached the pocket of the injured workman. About thirty cents of this would be absorbed by insur-

ance agents, another 20 cents would be used up by the insurance company in overhead expenses and the other 25 cents would be eaten up in meeting the fees of lawyers. The problem of workmen's compensation then was to substitute for this wasteful and inefficient method of indemnifying workmen an economic and efficient method which would ensure every workman who received injury in the course of his employment without his negligence, receiving a fair and adequate compensation.

Settling Claims Under German Law.

In most countries the problem was approached by way of removing one by one the common law defences of employers. This method of attacking the problem, however, was only partially successful. The insurance agent and the legal adviser continued to play the game as before and just as extravagantly. While more verdicts were recovered than formerly, a large proportion of industrial accidents still remained uncompensated. In one country only, that of Germany, was the problem dealt with in a thoroughly scientific way. The Germans, as you know, are the most scientific people in the world. Well, in that country they decided to eliminate the insurance agent and the legal adviser. Accident claims were automatically paid out of funds to which workmen, employers and the State contributed. These funds are controlled by the State. Claims are settled by arbitration boards of employers, workmen and Government appointees. Such a system has one great advantage which is entirely lacking in all other systems—it enables the payment of compensation on a periodical, instead of a lump sum, basis. In other words, it introduces the pension system. Now there are workmen who would rather receive \$1,500 at once than \$6,000 say, spread over ten years, on the principle, I suppose, that a bird in the hand is worth two in the bush. But this principle so far as compensation is concerned is a dangerous one, for the reason that few of us know how to look after our own money—most of us are far more competent to deal with and look after the money of other people. Hence when a workman receives an accident award of \$1,500, he finds himself grown extremely popular over night. Numerous friends suggest numerous ways in which they can duplicate and triplicate his capital in a marvellously short time. The inevitable result, of course, is that the money which is meant to furnish relief is lost either in speculation or dissipated in a blow-out in a very short period and the workman is then in want.

Under the pension system a workman only handles his monthly or weekly pension as the case may be, and rash investment or dissipation is rendered impossible.

In Ontario, the German system above briefly outlined was to a certain extent followed drafting the Act.

Divisions of Employers.

In turning to an examination of the Ontario Workmen's Compensation Act, I am reminded of the story of the Scotchman who drank a queer mixture every night before going to bed. This mixture consisted of

Address delivered before a meeting of the managers and foremen of the Canadian General Electric Co., at Oshawa, Ont.

whiskey and beer in equal proportions. When asked by an inquisitive friend why he did this he said: "Whenever I drink whiskey alone I get drunk without getting full; whenever I drink beer I get full without getting drunk, and as I wish to get drunk and full both at the same time I mix my drinks." Well, my case is the reverse of that of the Scotchman in this story. The Act has some very fine whiskey in it and a large amount of very weak beer. I shall endeavor to extract the whiskey. The Act proposes to deal with three large divisions of employers in three different ways: Employers coming in division (1) which, roughly speaking, applies to all manufacturing industries, are compelled to insure their employees in a provincial insurance fund. Accident claims are submitted to, and decided by, a provincial insurance Board.

Division number 2, is applicable to certain corporations such as railways, telephone companies, telegraph companies and certain classes of navigation. Such employers insure their own workmen but the claims are passed upon by the aforesaid Board.

Division number 3 is a residuary division applicable to all employers such as farmers, professional men, etc., who do not come under the first two divisions. Employers in this division remain liable to a common law action by their injured workmen with their defences removed.

We are concerned with division number 1. All the larger manufacturers of the country are to be grouped into classes, assessed premiums and subjected to the supervision of a provincial insurance Board for workmen's compensation purposes. This Board is to consist of three members or Commissioners who will be quartered in the Parliament Buildings in Queen's Park at Toronto. This Board will assess, levy and collect premiums from individual employers according to the class and hazard of their industry. With the premiums which they collect an accident fund will be formed out of which all workmen in the insured industries will be automatically compensated.

Who are workmen under the Act? Every person engaged in industrial employment and subject to the hazards of the industry is deemed a workman. Two large classes of employees only are excepted, namely, casuals, or those who do piecework in their own homes, and such of the clerical staff who are not ordinarily subject to the dangers of the industry.

What injuries are compensated? All injuries by accidents arising out of and in the course of the workman's employment are to be compensated, provided that they last for seven days. If an injury last for less than seven days no compensation will be given to the workman. If it lasts for more than seven days the compensation reverts back to the time of the occurrence of the accident, that is, it is paid from the first day.

Who are dependents under the Act? The following are dependents—wife, husband, father, mother, grandfather, grandmother, stepfather, stepmother, son, daughter, grandson, grand-daughter, stepson, step-daughter, brother, sister, half-brother, half-sister and those who stood in relation of parent to the injured workman or to whom the injured workman stood in relation of parent.

You see that the Act is very broad and far-reaching, covering practically all workmen, extending to all industrial accidents and making provision for all dependents.

The Schedule of Benefits.

We come now to the schedule of benefits, or scale of compensation to which a workman or his dependents is entitled in case of an industrial accident. I shall first deal with the death benefits. If a workman is killed while engaged in industrial employment his dependents are to receive expenses of his burial up to \$75. His widow will receive a pension of \$20 per month for life, or \$240 a year. His widow, if there are children, will receive in addition \$5 per month for each child up to a maximum of \$20 so that the total compensation received by a widow with four or more children will be \$40 per month or \$480 per year. If the children are rendered orphans by the accident they will receive \$10 each per month as a pension, but not more than a maximum of \$40 per month. If the workman died before the time of his death was under 21 years of age his parents, if dependent on him, are entitled to receive compensation of \$20 per month until such time as the deceased workman would have attained the age of 21 years. If there are other dependents they shall receive compensation not more than \$40 per month only so long as their dependency would have endured. If a widow in receipt of a pension should marry she would cease to be a beneficiary on the pension fund, but would receive a marriage settlement of two years' pensions, or \$480. Children cease to obtain pensions when they attain the age of sixteen years.

It may be of interest to note just what amounts this pension will reach in certain periods of time. A pension to a widow of \$20 per month would in ten years reach the total sum of \$2,400, in twenty years \$4,800, in thirty years \$7,200, in forty years \$9,600 and in fifty years the large amount of \$12,000. In Washington for a smaller scale of benefits than in Ontario they have estimated that the average maximum will be \$4,000. The average in this province, therefore, would be somewhat higher. These then are the death benefits.

Permanent or Partial Disability.

Let us now examine the benefits which a workman who is seriously injured will receive. These benefits depend on 100 per cent of the earnings. If a workman has a wound as known as a permanent total disability, as an instance, the loss of both legs, he would receive \$100 an equivalent to 55 per cent of his annual earnings at the rest of his life, but his earnings must not be calculated on a larger sum than \$2,000. A workman meeting with a permanent partial disability, such as the loss of a hand, is to receive a pension equal to 55 per cent of the impairment of his earnings capacity. In other words, if a workman earning \$20 per week loses his hand and upon returning to work finds that he can only earn \$10 per week he would be entitled to a pension corresponding to 55 per cent of the impairment, that is \$5.50 per week. Temporary total disability, such as a sprained back, is also compensated on 55 per cent of the impairment basis. Accidents which result in temporary partial disability, shall receive no compensation unless the impairment is more than 10 per cent of the earning capacity.

What exactly does a serious injury to a workman mean to the employer, or rather group of employers? If the workman should be in receipt of a salary of \$2,000 or more and met with a total disability accident he would receive as a pension \$1,100 a year. Total pensions would accumulate in ten years to \$11,000, twenty years \$22,000, thirty years \$33,000, forty years \$44,000 and fifty years \$55,000.

Another feature of the Act which is of considerable importance to you is the procedure to which you have to conform when an accident has occurred in your shop. A return has to be made by the employer of the accident, notifying the Board by registered post of the accident. This report should contain the following information: First, the nature of the accident; second, the time of its occurrence; third, the name and address of the workman; fourth, the place where the accident happened, and fifth, the name and address of the physician or surgeon (if any) by whom the workman was or is attended. The responsibility of submitting these returns will very largely devolve upon you as representing your employer. The penalty for failure to observe this regulation is \$50.

We come now to the third and last branch of our subject, namely, that of accident prevention. In former times when employer, workman and apprentice worked side by side in the same little shop it was possible for an employer to exercise such minute and careful supervision over his fellow-workmen that accidents were few and far between. Such as did occur were attended to as a rule by the employer himself. Under modern conditions where organization and centralization are ever on the increase, an intimate relationship between employer and employee is impossible. This in itself is perhaps unfortunate. Employers, however, still have that wide and humanitarian interest in their workmen which makes them feel acutely any misfortune which befalls one of their employees, even though that employee be not personally known to him. You as foremen now take the place and act in the stead of the employer. It is you who are, and will be made responsible for the number of accidents which occur in your part of the shop.

Of late we have been hearing a good deal of the "Safety First" movement. Of this movement you are going to hear more and more from now on. It is one of the healthiest movements of the times. The annual accident roll of industries when examined in statistics is simply appalling. In the United States of America, which has a population roughly speaking of some 100,000,000 inhabitants, there are every year 35,000 persons killed in industries, or one person every fifteen minutes. There are also 2,000,000 injured, or one person every sixteen seconds. No further comment is required to show the tremendous need for preventing these accidents—and they can be prevented. Certain firms who have specialized in accident prevention have cut their accident rate in half in one, two and three years. And this has been done not by the employer alone. True, he furnishes the safeguards and printed danger notices, but the real work is done by the workman and foreman. The unthinking person is only too apt to believe that accidents are all due to the hazard of the industry. This is not so. German statistics, and I may say these statistics are compiled by employers, workmen and arbitrators in collaboration, prove that only 43 per cent of all industrial accidents are due to the hazard of the industry; 29.23 per cent are the result of carelessness on the part of the workman; 18.13 per cent are due to the employer's fault, and the remaining 10 per cent are caused by workman and employer together. From these figures you can deduce the possibilities of checking the accident rate.

You, holding positions of responsibility in one of the largest plants in this country have a splendid opportunity of doing a humane work. By exercising that personal control over your men which was formerly

exercised by the employer himself, by never failing to instill in your men the "safety first" habit, by constantly pointing out the foolishness of taking chances—a habit which is only too strongly embedded in our national life—you have indeed a rare opportunity of showing an example not only to plants similar to yours, but to the other plants of this province.

The Companies Case Decision

The Canadian Manufacturers' Association has issued the following circular on the subject of the recent Privy Council decision on the Companies Case, by which it was declared that a company holding a Dominion charter was privileged to carry on business in any province without re-licensing: as follows:—

"The decision rendered a few days ago by the Privy Council in the case of the John Deere Plow Co. v. Wharton marks the successful conclusion of five years' effort on the part of the Legislation Committee of the Association to secure a solution of a number of difficult questions surrounding the incorporation and licensing of companies. Ever since Confederation both the Dominion and the provinces have incorporated companies but there has always been grave doubt as to their respective jurisdiction. There was doubt whether a provincial company was competent, under any circumstances, to carry on business outside the incorporating province. There was no doubt that a Dominion company was competent to carry on business in every province but the question was whether such a company should be compelled to comply with the provincial laws requiring it practically to become re-incorporated in every province in which it sought to carry on business.

The Privy Council in the John Deere case has answered this last question in the negative. As a result it will now be recognized that a Dominion company has, and always did have, power to carry on business in every province without becoming licensed or registered under these provincial Acts.

"The Act of the Province of Quebec specifically excepts Dominion companies but companies incorporated in other provinces and other countries are required to become licensed in Quebec as in the other provinces.

"It results obviously from the decision in the John Deere case that a Dominion company is in a better position than a provincial company. The question whether provincial companies should abandon their provincial charters and take out Dominion charters must be determined largely with reference to the circumstances of individual companies, their methods of carrying on business, etc. Members of the Association who are in doubt as to their position in any of the provinces should consult freely with the Legal Department which is fully equipped to advise or undertake any work in connection with the subject."

DYESTUFFS STILL COMING.

The American tank steamer Sun, bound from Rotterdam for New York, with a cargo of dyes valued at \$3,000,000 arrived recently in Boston.

After being supplied with coal and water, the steamer sailed for New York. This shipment of dyestuffs is one of seven which has been contracted for, this being the second to leave Rotterdam for this country since November 1.

WHO'S WHO IN THE CANADIAN PULP AND PAPER INDUSTRY

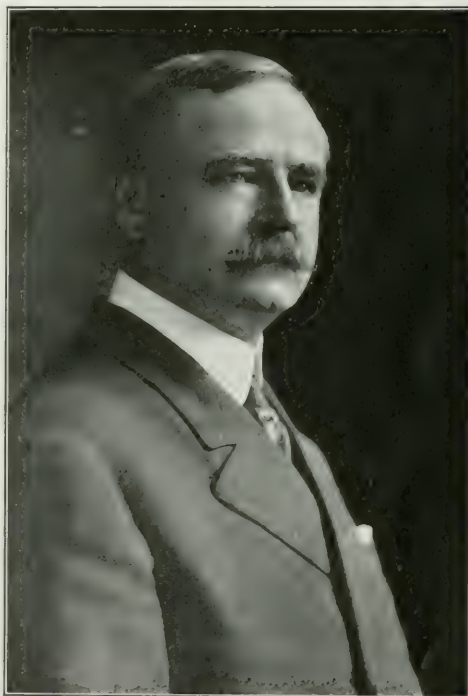
WILLIAM P. RYRIE, Managing Director of Becker & Co., of America, Limited.

One of the hardest men to catch in his office is William P. Ryrie, of Toronto. He is on a trip to Europe, down in the Eastern States, flying across the continent, or in some other remote part. But he is not neglecting business, for his jaunts are not of a holiday character. He is either getting information in regard to market conditions, studying shipments and demands or selling pulp, as he does by the thousands of tons every year, obtaining supplies from nearly every country in Europe. No man is more conversant than he with the foreign situation. As Managing Director of Becker and Co., of America, Limited, he carries on extensive operations in the United States, for the reason that the market in Canada is very much restricted owing to the imposition of a Canadian tariff duty of twenty-five per cent. As is well known all foreign pulp enters the United States duty free. While this condition militates against a large foreign trade being done in the Dominion, Mr. Ryrie expresses himself quite content that our own market should be supplied from local sources as this is a direct encouragement to Canadian enterprise and industry.

About sixteen years ago when on a visit to the Old Country, Mr. Ryrie had the pleasure of meeting F. E. R. Becker, head of the firm of Becker and Co., Limited, the largest importers of wood pulp in the United Kingdom, who in spite of the heavy proportion of imports cleared by their customers last year, headed the list with 230,938 tons of wood pulp, which exceeded the total amount cleared by all their competitors by 115,171 tons. This world-wide known concern import mechanical and chemical pulp from practically every country on the globe, and are the selling representatives of the largest pulp mill in the province of Quebec as well as several in Nova Scotia. For some years Mr. Ryrie acted for the company in a consulting capacity regarding conditions in America, being given a liberal retainer for his services, but gradually this connection became more intimate, and the alliance broadened. The outcome was that three years ago the firm of Becker & Co. of America, Limited, was formed with Mr. Ryrie as Managing Director, to carry on the trading of the company on this side of the Atlantic. The company are selling agents for many mills as well as traders or merchants buying the pulp outright and disposing of it to the largest consumers in Uncle Sam's domain. Previous to the outbreak of the war, supplies were purchased in Sweden, Norway, Finland, Germany, Russia, Austria and Roumania, but now the sources are largely confined to Scandinavia and, while the head offices of the company are in Toronto, shipments are landed principally at Boston, New York, and other Atlantic ports.

With the exception of a few years spent in Montreal, Mr. Ryrie has always lived in Toronto and finds the city a central and convenient point to carry on his extensive operations. His father, who was born in Scotland, came to Canada in 1843 and located in Toronto where he carried on a large contracting and building business. Of the three sons, James, William and Harry, all have taken a prominent part in the

business life of the city, James and Harry being the members of the firm of Ryrie Bros., Limited, the celebrated diamond merchants and jewellers. William was educated at the public and Grammar schools, and his first association with the paper trade was in the early days of Barber and Ellis, Limited, back in the late seventies. He was a pioneer traveller for them when they succeeded the firm of A. Dredge and Co. His next connection was with William Warwick (now of Warwick Bros. and Rutter), where he remained for a few years as head of the stationery department. In 1882 he went to Montreal and linked up with the his-



toric paper house of Alex. Buntin and Co. After some years spent in representing them as far west as Winnipeg, he started business on his own account in Canada's commercial metropolis. Returning to Toronto in 1894, he formed the Ryrie Paper Co., opening a warehouse on Bay Street, where he handled all kinds of foreign papers—bond, book, ledger, litho, engraving, gum, art, etc. After five or six years he discovered there was more money in acting as a selling representative and letting the mills carry or supply the stock, and until the spring of 1911 he acted in that capacity.

Then came his strong alliance with Becker and Co., Limited, of London, England, as already outlined.

Outside of business life, the chief hobby of Mr. Ryrie, who is one of the most genial, kindly and courteous gentlemen identified with the trade, is Masonry, in which he has held many responsible offices and has attained the rank of thirty-third degree in the Scottish Rite. He was elected to the exalted and important position of Supreme Grand Master of the Knight Templar Body in Canada for two years, 1911-1912. An active member of the Board of Trade, a leading figure in the National Club of which he has been a director for several years, President of the Old Boys' Association of the Toronto Grammar School, and an ardent devotee of water pastimes, being associated with the Royal Canadian Yacht Club, he has also taken a deep and quiet interest in charitable work of all kinds. Whether in business negotiations or social intercourse Mr. Ryrie can count his friends by the score, not only in his native city, but among the trade throughout the country, and so far as known has only one outstanding frailty—he is a bachelor. He has never been diffident regarding any worth-while proposition except matrimony—and the only reason his confreres can assign for his not making a venture in this direction, is that he still considers himself too young to accept such responsibilities as would necessarily be incurred.

Ottawa Notes

Ottawa, Ont., November 10.—The Supreme Court of Canada, at its sitting here a week ago had before it two cases of interest to the lumber and paper trade, and both of which hinge on leases of Crown lands obtained from the Government. One was that of Booth vs. the King, and the other the Vancouver Lumber Company vs. the King. Judgment was reserved in both cases.

The case of Booth vs. the King concerns a license obtained by Mr. J. R. Booth from the Superintendent of Indian Affairs to cut timber and pulpwood on certain Indian lands. The license was renewed each year until the year 1909 when the Indian department refused to renew it. Under the Indian act the superintendent could grant licenses to cut timber on Indian lands, and though such license was not to be for longer than a year an Order-in-Council passed in 1888 provided that a licensee who had paid all dues and complied with other conditions of his license could renew his license on making application. On the refusal of renewal to Mr. Booth the question arose as to whether he had an absolute right to renewal or if it were always within the discretion of the Crown. The Exchequer Court took the latter view and hence Mr. Booth's appeal.

The case of the Vancouver Lumber Company vs. the King concerned the leasing by the Dominion Government in 1899 through the Minister of Militia under authority of an Order-in-Council, of Deadman's Island, Vancouver, which is a valuable timbered property. The lease was for twenty-five years renewable and provided that either party could terminate it by notice and that the Crown could terminate by demand for possession if it should be necessary for military purposes. In 1890 the Minister of Militia without any further Order-in-Council, amended the license by executing an indenture which amended these conditions and provided for

the renewal of the lease for twenty-five more years after it expired. The Crown claims the last indenture was executed without authority and asks to have it cancelled. Such cancellation was granted by the Exchequer Court and hence the appeal.

Water conditions in the Ottawa River have improved somewhat of late. This is due partly to the fact that all the lumber mills on the stream have closed down and partly to recent heavy rains which have raised its level somewhat. As a result pulp and paper firms in this district are operating with somewhat less difficulty than has been the case for months past. The J. R. Booth Company reports that it is now able to manufacture its own pulp again and as a result its heavy purchases from the Abitibi Pulp and Paper Company have almost ceased.

British trade returns for October, which have just been received by the Trade and Commerce Department, indicate that Canadian manufacturers are shipping greatly increased quantities of pulp to the United Kingdom. During this month the Canadian export was 26,037 tons of mechanical wet pulp as against 5,151 in October of 1913. The Canadian trade agent at Manchester also reports that out of 106,000 bales of wood pulp which have reached that port within a few weeks, shipments of 40,000 bales each were of pulp from Chicomini.

That section of the National Transcontinental from Cochrane to Superior Junction is to be operated this winter though whether by the Government is not definitely known. Reports which have reached the Department of Railways and Canals are to the effect that there is an enormous quantity of pulpwood already cut and stacked along the line from which the line expects to draw its chief traffic.

FELT MANUFACTURERS LOSE SECRETARY.

(Special to Pulp and Paper Magazine.)

New York, N.Y., December 10, 1914.

At a meeting of the Felt Manufacturers' Association held at Buffalo, N.Y., on Thursday, December 3, the resignation of John C. Collins as secretary and treasurer of the organization was accepted. Mr. Collins has accepted an offer for a bigger position in another field. In offering his resignation Mr. Collins said that it was with reluctance that he was giving up, as his "heart and soul were wrapped up in the work." Every member of the association regretted to see Mr. Collins leave the body for which he has done so much good.

The regular election of officers for the coming year does not take place until January, but it is probable that A. A. Price, who has been inspector for the association during the past year, will be honored with the secretaryship. Mr. Price is familiar with all the needs and duties incumbent upon the office and will no doubt be chosen as Mr. Collins' successor at the meeting next month.

It was also decided that Buffalo was a more central point for the headquarters of the association than Cincinnati, and consequently the members decided to move the executive offices from their present location in the Central Building at Cincinnati, Ohio, to Buffalo, next year. The annual meeting will be held in Buffalo on January 7.

The meeting was well attended and the members were enthusiastic over the success of the work undertaken and accomplished since the organization was formed last February.



NEW PATENTS



Paper making machine, patented in United States Patent Office, November 24th, 1914, by Chester Allen Mellinger, Herman Reed Harrigan, Benjamin Denver Coppage, Harvey Greenleaf McDowell and John Warren Vedder, of Wilmington, and Christopher John Strobel, of Elsmere, Delaware, assignors to the Pusey and Jones Company, of Wilmington, Delaware.

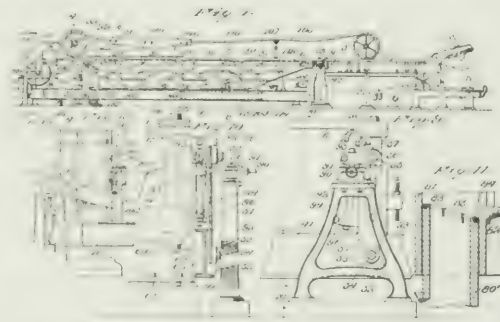
The inventors say:—This invention relates to the Fourdrinier part of paper making machines, and particularly to the type of machines in which provision is made for a considerable vertical adjustment of the forward or outer end of the Fourdrinier part to tilt the same to different angles with relation to the horizontal, the desire as to the exact angle of tilt varying with different paper manufacturers.

The objects generally and principally are to provide a rigid adjustable base frame or beams, upon which the shake frame or section is mounted to be laterally vibrated or shaken without also shaking said base-frame and other parts (such as the save-alls and associated roofs) which do not require shaking to provide a structure in which the save-alls and their associated roofs are mounted on said base-frame, so that they participate in the vertical adjustment and therefore do not interfere with and restrict a considerable adjustment to provide such a structure in which the entire base-frame, as well as the shake frame, more particularly the rails thereof, and other parts mounted on said base-frame, pivot about a single common axis in and vertical tilting adjustment of said parts, thereby avoiding strains and stress upon joints; to provide a connection between the shake-frame and the means for vibrating the same that will afford a range of adjustment commensurate with the considerable vertical adjustment of which the forward end of the Fourdrinier part is susceptible; and to automatically adjust the height of the apron of the flow-box through connections to the forward end of the base frame. These and other objects apparent from the detailed description are accomplished by the structure of this invention, a preferred embodiment of which is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation showing particularly the Fourdrinier part of the machine; Fig. 2 is a side elevation of the shake-frame of the Fourdrinier part of the machine; Fig. 3 is a plan view of the base-frame composed of two side beams and cross-bracing, and of the adjusting means for tilting the same; Fig. 4 is an elevation looking toward the right on line 4—4 of Fig. 1, with the breast roll and some of the other parts omitted; Fig. 5 is a sectional view on line 5—5 of Fig. 4, some of the parts shown in Fig. 4 being omitted for clearness; Fig. 6 is a vertical sectional view of the pivotal support at one side of the inner or rearward end of the base-frame and the shaking section; Fig. 7 is a side elevation of the parts shown in Fig. 6; Fig. 8 is a sectional detail on line 8—8 of Fig. 1; Fig. 9 is a side elevation in which the forward end of the machine is at the right and the rear end at the left (just the reverse of Fig. 1), and Fig. 10 is a sectional view on line 10—10 of Fig. 9, illustrating particularly the improved connection between the shake-frame and

means for vibrating the same; Fig. 11 is a detail sectional view of part of the flow-box shown in Fig. 1, and Fig. 12 is an elevation of part of the feed end of the machine showing a modified construction of flow-box.

The shaking-section or shake-frame of the machine includes a pair of longitudinal side rails 6, the inner ends of which may be supported in any suitable manner. In the construction shown (see particularly Figs. 6 and 7) the machine-frame 5 on each side of the machine is recessed to form a pair of ears 7, 7' and between each pair of ears is pivoted a support, which, in the preferred form of the construction consists of a block 8, the connection being formed by means of a pivot bolt 9, which passes through the ears and the block. This construction permits the shaking-section rails, which are connected to the supports in the manner to be hereinafter described, to have a vertical adjustment at their other or forward ends, the supports 8 during such adjustment turning on the bolts 9 as pivots. In other words, the shake-frame (of which rails 6 are part) may be tilted on the horizontal axis of bolts 9.



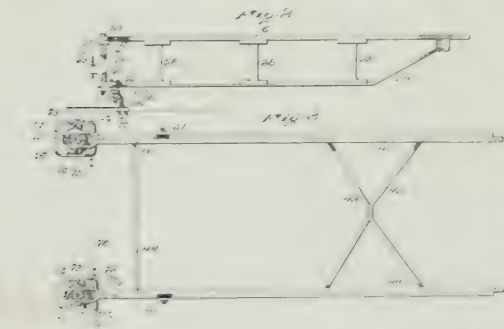
In order to provide for the lateral movement of the rails 6 produced by the usual vibration of the shaking-section, the rails are preferably pivotally connected to the supports 8. As shown, the top face of each block 8 is provided with an upwardly projecting circular boss 10, which engages a counterpart recess in a cap-piece 11. This cap-piece 11 is formed with a circular boss 12 which engages a corresponding circular recess in the underside of the end of its rail 6. A bolt 13 fastens each rail 6 to its cap-piece 11. By the construction which has just been described, it will be seen that each of the rails 6 is so supported as to be capacitated to receive a vertical movement and a horizontal shaking movement.

The outer ends of the side rails 6 are connected by a frame which preferably consists of a U-shaped casting 14, similar to that shown and described in Patent No. 635,511, granted to Thomas H. Savery, October 24, 1899. The connections between the ends of the rails and the ends of the casting may be effected in any suitable manner; as illustrated, particularly in Fig. 5, the upper ends of the U-shaped frame are formed with

sockets 15, in which are mounted headed-sleeves 15. A cap 17 fits over the headed end of 16, and a circular boss 18 on the cap fits a depression on the underside of the end of rail 6. A pin 19 on the cap engages a socket in the rail and prevents relative turning of these parts. The parts of the structure may be tied together in any suitable manner. As shown, long bolts 20, 20, are employed, one at each end of frame 14 passing through rail 6, cap 17, sleeve 16 and frame 14 with a nut on its lower end.

The U-shaped frame 14 is provided with suitable bearings for the breast-roll 21. In the construction shown (see Figs. 1 and 5,) these bearings are formed by vertically adjustable brackets 22, each resting against an adjusting-screw 23.

In order to stiffen the shaking-section and particularly the rails 6 thereof, suitable struts 24, 24 are employed, one for each rail (see Figs. 1 and 2), each strut being connected at one end to the inner end of its rail 6 with an interposed block, and at its other or outer end to the U-shaped frame 14. At said outer end each strut is riveted to the flange 25 of a sleeve 26 which latter fits into a recess 27 (see Fig. 5) of the frame 14 and is therein traversed by bolt 20. To further strengthen and stiffen the structure, each rail 6 and



its strut 24 are connected by upright braces 28 of which three are shown.

30, 30, 30, are a series of plates suspended from the underside of each side rail 6 by bracket arms 31 (see Figs. 1 and 9). The plates 30 of the two rails 6, 6, support the bearings for the opposite ends of table-rolls 32 over which runs the usual Fourdrinier or making-wire 33.

Any suitable means may be employed for vibrating the shaking section, but the connection from such means to said shaking section is preferably that hereinafter described. To assist the shaking action, and also to cushion the stopping of the shaking-section at each end of its vibration, we provide two coiled springs 34, 35 each housed in a telescopic casing comprising a fixed cup-like part 36 and a movable cup-like part 37, with the ends of the spring bearing against the bottoms of cup-like parts. The two springs and their cup-like casings are strung upon and supported by a rod 38 mounted in bracket arms on the machine base. A fixed bracket arm 39 depending from U-shaped casting 14 embraces rod 38 between the ends of the two telescopic parts 37, 37 of the telescopic casings. The dist. of the bracket arm 39 is elongated to allow for a considerable vertical adjustment of the outer end of the shaking section without disengaging said lock from the rod 38 and from between the casing parts 37, 37.

In general, the construction of the parts heretofore described in detail, and of other parts, such as the doekle straps 105 (only one of which shows in Fig. 1) and wash troughs 106, one for each strap, is such as is well-known and disclosed in prior patents. The improvements constituting the present invention reside in parts about to be described.

40, 41, are two beams preferably I-beams, joined at one end by cross-braces, 42, 43, of X-shape, and joined at their other end by a cross-brace 44 (Fig. 3). The rigid base-frame thus constituted is pivotally supported at its inner end by two upwardly extending curved arms 45, 45, rigidly secured at their lower ends to the inner ends of beams 40, 41, respectively, said arms at their upper ends pivoting on the projecting ends of bolts 9, 9. The common axis of said bolts thus constitutes a single axis on which the rigid base-frame and also the shake-frame pivot in the tilting thereof (and parts mounted thereon) to vary the inclination of the Fourdrinier part of the machine. At its other outer end the base-frame is suspended by means capable of a considerable range of vertical adjustment.

As shown in Figs. 1 and 3, the beam 40 has a forked extension 70 embracing a vertical standard 71 and a block 72 movable vertically between guiding surfaces of said standard. Two links 73, 73, pivoted at their upper ends on opposite sides of block 72 and at their lower ends to the two arms, respectively, of the extension piece 70, suspend beam 40 from said block 72. By similar construction, beam 41 is suspended from a block 72', movable vertically in a standard 71' at the other side of the machine.

In each standard 71, 71', there is a vertically disposed rotatable screw-threaded or worm shaft 74 making screw-threaded engagement through the block 72 or 72' for raising and lowering the same upon rotation of the shaft. A worm wheel 75 (shown in dotted lines Fig. 3, and inclosed by a cover in Fig. 1) is secured to the upper end of each shaft 74. A horizontal worm-shaft 76 has threaded end parts engaging the worm-wheels 75, 75, a tubular central portion into which the threaded ends telescope and are secured, and hand-wheels 77, 77, on said ends, by which the shaft may be rotated from either side of the machine to change the elevation of the front end of the base-frame and hence the angle of inclination of the Fourdrinier part of the machine.

For the purpose of rigidly bracing the forward end of the base-frame against participating in the vibration of the shake-frame supported thereon by springs, 50, 51, two guides 60, 60, are provided, consisting preferably of angular castings secured to foundation plates by bolts 61 passing through slots in the castings. The vertical face of each casting is faced with a brass plate 62, which bears against the smooth upright face of a block 63 (preferably of iron) of which there is one secured to the inner face of each of the beams 40, 41. An adjusting screw 64 for each guide enables its brass face to be moved into firm engagement with the block 63, thereby preventing vibration of the base-frame and its beams, while at the same time permitting and guiding said frame and its beams in the vertical adjustment thereof to tilt or vary the inclination of the shake-frame.

The forward end of the shake-frame is supported from the base frame by two multiple-leaf flat spring bars 50 and 51. Spring bar 50 is clamped at its lower end between a block 52 and plate 53 by a bolt 54 passing through said block and plate and through beam 40 rigidly securing said parts to said beam. The lower end of spring bar 51 at the other side of the ma-

chine is similarly fastened to the beam 41. A bolt 55 and plate 56 rigidly clamp the upper end of each spring bar to a flat face of an outward projection 57 on the upper end of each arm of the U-shaped frame 14, beneath an over-hanging shoulder 58 on said projection.

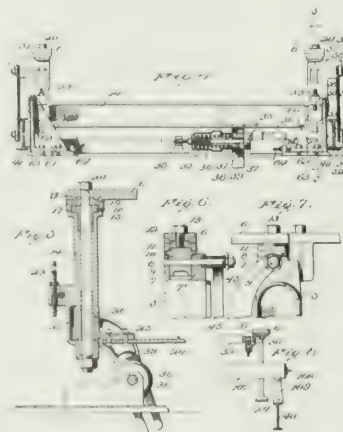
107, 107, 107, are save-all receptacles, each resting at its opposite ends on rollers 108, each roller being journaled in an upright 109 mounted upon one of the beams 40 or 41. Intermediate roofs 110, 110, rest on the save-all receptacles, and end roofs 111, 112, are supported partly by the save-all receptacles and partly by uprights 113, 114, mounted on beams 40 and 41. These roofs shed liquid falling thereon into the save-all receptacles 107.

The flow-box 80 is of approximate U-shape in side elevation, providing space between the upright arms thereof through which the shaft 76 passes. The inner end of arm 80' of the U-shaped flow box has a vertically movable telescoping member, sleeve, or apron-part is 81, from which the liquefied pulp mixture is conducted onto the Fourdrinier wire 33 by an apron 82 fixed to and movable with said part 81. A link 83 (Fig. 1) connects beam 40 to part 81 at one side of the machine; a similar link, not shown, connects beam 41 to part 81 at the other side of the machine. It follows that any vertical movement of the front end of the base-frame and parts mounted thereon, including the shake-frame, making-wire and other parts, will impart corresponding adjustment to the telescoping part 81 of the flow-box and the apron 82 carried thereby. To provide a tight joint between the movable member 81 and the part 80' of the flow-box, there is provided a special packing consisting of rubber tubing or hose 83 (Fig. 11) positioned in a recess about the upper edge of part 80' and held in place by four wooden (preferably maple) strips 84 about the four sides respectively. Each strip is held by screws 85 adapted to be set up to further clamp the strips against the rubber tubing and thereby expand the same outwardly against the inner surface of part 81 to tighten the joint.

In the modified structure shown in Fig. 12, the inner arm 86 of the U-shaped flow box is of the same height as the outer arm 87 thereof, and a sleeve or telescoping apron-board part 88 surrounds arm 86 below its upper end and is vertically movable thereon, sliding on brass angle strips 89 at the four corners thereof. The apron or apron-board 100 is fixed to and hence moves with part 88. The pulp mixture flows through an opening 101 in the wall of arm 86 of the flow-box onto apron 100. To prevent leakage between the parts 86 and 88, a packing, similar to that previously described with reference to Fig. 11, is positioned along the bottom and side edges of opening 101, the rubber tubing portion of said packing bearing against and making a tight joint with the apron-board part 88. A link 103 at each end of the part 88 connects the same to the side beams of the base-frame, imparting vertical movement of the latter to the apron-board part.

The machine herein illustrated is designed to provide for elevating the front end of the base-frame as much as from 16 to 18 inches above a horizontal position, and even this may be increased if desired. Ordinarily the shake-frame of paper machines is vibrated by a power-driven crank-pin connected to said frame through a pitman, bar or rod, of sufficient flexibility to avoid undue strain caused by relative movement of parts and ordinary adjustments. But for a range of adjustment such as provided for by the present machine, the mere flexibility of a pitman or connecting

rod is not adequate and satisfactory. Therefore, means have been devised such as illustrated in Figs. 9 and 10. As there shown, the end of a pitman or connecting rod 90 is supported by and works in a bearing 91 on a standard 92 at the side of the machine. The rod is sufficiently flexible and has sufficient play in bearing 91 to allow for slight sidewise movement imparted to its outer end by the driving crank-pin (or equivalent not shown in the drawings. At its inner end pitman 90 has sliding connection with the shake-frame in the form of a collar 93 movable along a slightly curved rod 94 clamped at its ends in split lugs 95 and 96 on the U-shaped casting 14 of the shake-frame. The curvature of rod 94 is upon an arc having its centre in the axis (of the pivot bolts 9) on which the base-frame turns. It follows that any change in the inclination of the base-frame and parts thereon will simply cause the rod 94 to move in the collar 93 at the inner end of pitman 90, without the imposition of any strain on the connection due to such change of inclination or adjustment.



What is claimed is:—

1. The combination in a paper making machine, of a base-frame adapted to be raised and lowered at one end and pivotally supported at its other end to turn on a single approximately horizontal axis; a shake-frame supported at one end by the base-frame and adapted to laterally vibrate independently of the latter and at its other end pivotally supported to turn about the aforesaid horizontal axis as it is raised and lowered with the base-frame; and means for raising and lowering the non-pivoted end of the base-frame.

2. The combination in a paper making machine, of two approximately parallel supporting beams adapted to be raised and lowered at one end and pivotally supported at their other end to turn on a single approximately horizontal axis; a shake-frame supported at one end by the supporting beams and adapted to laterally vibrate independently of said beams, said shake-frame including side rails pivotally supported to turn about the aforesaid horizontal axis as the shake-frame is raised and lowered with the supporting beams; and means for raising and lowering the non-pivoted ends of the supporting beams.

3. The combination in a paper making machine, of a base-frame adapted to be raised and lowered at its forward end and including in its structure two approxi-

mately parallel beams, cross-bracing rigidly joining said beams, and arms extending upwardly from the beams at one end thereof, said base-frame being pivotally suspended to turn on a single approximately horizontal axis passing through the upper ends of its said arms; a shake-frame supported at one end upon the base-frame by spring bars permitting lateral vibration of the shake-frame independently of the base-frame, said shake-frame including in its structure side rails pivotally supported to turn about the aforesaid horizontal axis as the shake-frame is raised and lowered with the base-frame; means for raising and lowering the non-pivoted end of the base-frame; a making-wire extending over the shake-frame; and one or more save-all receptacles mounted on the base-frame beneath the making-wire.

4. The combination in a paper-making machine, of a base-frame including in its structure two approximately parallel supporting beams adapted to be raised and lowered at one end and pivotally supported at their other end to turn on a single approximately horizontal axis; a shake-frame supported at one end by base-frame and adapted to laterally vibrate independently thereof, said shake-frame including side rails pivotally supported to turn about the aforesaid horizontal axis as the shake-frame is raised and lowered with the supporting beams; means for raising and lowering the non-pivotal end of the base-frame; and two adjustable guides having upright surfaces contacting upright surfaces of the two beams of the base-frame respectively at the non-pivoted end thereof to resist vibration of the base-frame with the shake-frame.

5. The combination in a paper making machine, of a U-shaped flow-box; a base-frame pivotally supported at one end and adapted to be raised and lowered at its other end; a shake-frame mounted on said base-frame; and means for raising and lowering the non-pivoted end of the base-frame, part of said means being positioned in the space between the upright arms of the U-shaped flow-box.

6. A flow-box for paper making machines having a fixed part and a movable apron-part adapted to be raised and lowered, one of said parts being sleeved about the other whereby the parts move one within the other in the movement of the apron-part.

7. A flow-box for paper-making machines having a fixed part or reservoir and a movable apron part sleeved about and adapted to slide up and down on said fixed part.

8. A flow-box for paper making machines including in its structure a U-shaped reservoir, a relatively movable apron-part associated with one upright arm of said reservoir, one of said parts being sleeved about the other whereby they move one within the other in the movement of the apron-part.

9. A flow-box for paper making machines having a fixed part and a relatively movable apron-part adapted to be raised and lowered, one of said parts being sleeved about the other whereby the parts move one within the other in the movement of the apron-part, and a packing positioned to prevent leakage between said parts and consisting of rubber tubing and clamping means adapted to compress said rubber tubing to form a tight joint.

10. The combination in a paper making machine, of a base-frame pivotally supported at one end, means for raising and lowering said base-frame at its other end; a shake-frame carried by the base-frame; a flow-box having a fixed part and a movable apron part adapted to be raised and lowered, one of said parts being sleeved about the other whereby the parts move

one within the other in the movement of the apron-part; and connections from the base-frame to the apron-part of the flow-box raising and lowering the latter simultaneously with the base-frame.

11. The combination in a paper making machine, of a shake-frame; means for raising and lowering said shake-frame at one end to impart different degrees of tilt thereto; a driving rod or pitman for imparting vibratory or shake-movement to the shake-frame; and a sliding connection between said driving rod and shake-frame whereby the latter is adapted to be raised and lowered without corresponding movement of the driving rod.

12. The combination in a paper making machine, of a shake-frame; means for raising and lowering said shake-frame at one end about a pivotal axis at its other end; driving rod or pitman for imparting vibratory or shake-movement to the shake-frame; and a sliding connection between said driving rod and shake-frame working in an arc, centred in said pivotal axis whereby the shake-frame is adapted to be raised and lowered without corresponding movement of the driving rod.

METHOD OF DRESSING WOOD-PULP-GRINDING STONES.

Edward F. Millard, of Watertown, Mass., Patentee.

Patented in United States Patent Office, Nov. 24, 1914.

The inventor says:—

This invention is a method of uniformly developing the grit on the flat faces of lengthwise extending, peripheral ribs formed on stones for grinding wood into pulp for use in the manufacture of paper, particularly newspaper, and for forming, alternately with such ribs, lengthwise extending grooves that form channels for the lateral escape of the pulp from the stones during the grinding operation.

In the accompanying drawings, Figure 1 is a partial elevational view of the periphery of a pulp grinding stone dressed or fashioned according to my method; Fig. 2 is a partial end elevation of the stone shown in Fig. 1; Fig. 3 is an elevation of the plain-surfaced grinding stone, with a smooth roll extending across the periphery of the grinding stone and adapted to be rotated therewith. This view illustrates the first step in my new method. Fig. 4 shows the grinding stone after its surface has been subjected to the smooth roll shown in Fig. 3, and also shows, extending across the periphery of the grinding stone, a fluted bush-roll adapted to be rotated with the grinding stone and to effect the second and final step of my method, which consists in the formation of the alternating flat-topped grinding ribs in the peripheral surfaces of which the grit is uniformly developed, and the grooves that carry away the pulp during the grinding operation; and Fig. 5 is an end elevation of the form of the bush-roll used.

In accordance with this invention, after the grinding stone *x* has been first turned down peripherally to adapt it to frame containing wood pockets in a grinding machine (not shown), the turned down peripheral surface is smoothed by the use of a smooth surfaced roll *y* extending across the periphery of the grinding stone and rotated in connection therewith to literally crush down all the high points naturally or normally in the peripheral surface of the turned or turned-down stone *x*. This bush-roll is of steel or other hard metal, and has a smooth surface. The grind-stone *x* and the smooth roll *y*, each of which has a length greater than the thickness of the grinding stone, from side to side of the latter, are rotated for a sufficient length

of time to develop the grit of the stone uniformly around its periphery and from side to side of the stone.

I am aware that it is old to true grinding stones by rotating them one against another with their peripheries in contact. But such an operation necessarily develops high points and indentations on the peripheral surface of each stone, because every stone has some hard spots and some soft spots, and the hard spots or points of one stone will always indent the soft spots of the stone in contact. The purpose of running one grind-stone peripherally in contact with another is not to develop the grit of either stone uniformly but, on the contrary, to true the grind-stones and to develop

the ribs 2 serve to carry off the pulp laterally of the stone during the grinding operation. The bush-roll *z* is of a length that exceeds the width of the stone *x*, so that the alternating ribs and groove are uniformly produced and extend from one side to the other of the stone. The length of the bush-roll should at least equal the width of the stone. It is essential that the stone *x* and the smooth roll *y* (Fig. 3) be rotated at the same surface speed in order to crush down the high points uniformly and that the smooth roll be kept in rotation through this step, for if the rotation of the smooth roll be arrested and the stone allowed to rotate against the bush-roll while at rest, the surface of the stone will be glazed instead of having its grit developed. Wood pulp grinding stones the peripheries of which are thus formed can be used for the production of a finely ground pulp of unique character in respect of uniform fineness and improved quality especially desirable in the manufacture of all fibre newspaper. The pulp produced is of a uniform fibrous character, and when passed through any proper paper-making machine is converted into paper of uniform strength, of soft surface and of a minimized degree of brittleness, without incorporation of sulphite or other strength-giving material. Such paper is strong enough to run through high-speed paper machines, and the paper itself is strong enough to be run through high-speed machines, and the paper itself is strong enough to be run in printing presses. The ridges 2, as stated, are flat-surfaced or topped, and are preferably disposed three to the inch, around the periphery of the grinding stone. I am not aware that any pulp grinding stones have ever been dressed with continuous transverse, alternating ribs and grooves, nor am I aware that any one, prior to my invention, has ever developed or attempted to develop the peripheral grit of the stone uniformly by crushing the natural or normal high spots or points of the stone to the level of the soft spots.

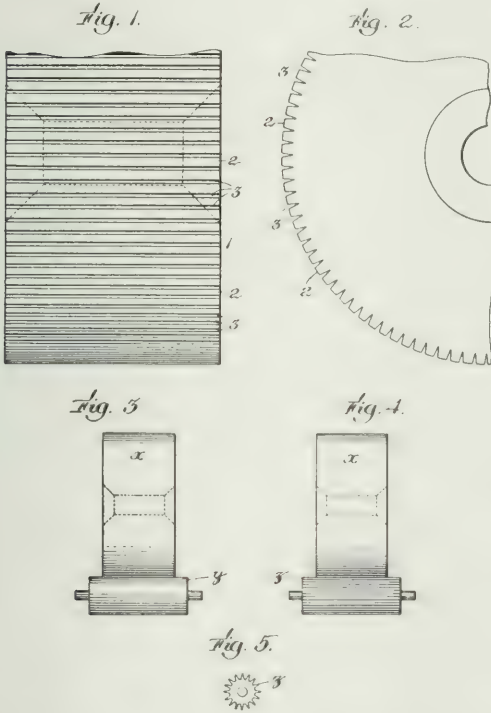
Having described my invention, what I claim as new and desire to secure by Letters Patent is:

The method of dressing the periphery of a wood pulp grinding stone, consisting in first crushing the high spots or points of the peripheral surface of a trued stone to the level of the low points or spots by continuous rotation of the surface of the stone and a therewith contacting smooth roll at equal surface speeds and thereby developing the grit uniformly across and around the periphery of the grinding stone; and secondly, in transversely and uniformly grooving and ribbing the levelled periphery of the stone from edge to edge to form a uniform series of transverse flat-topped ribs for grinding the wood and an alternating series of transverse groove for escape of the ground pulp.

THE PULP SITUATION IN MANCHESTER.

The Canadian Trade Commissioner at Manchester reports that future supplies of chemical wood pulp are causing considerable uneasiness to manufacturers and consumers. Not only is production at a standstill in the countries at war, but in Norway and Sweden the mills have been greatly hampered, and in many instances brought to a temporary standstill, owing to lack of coal and chemicals.

According to the Paper Trade Review, the imports of chemical wood pulp into the United Kingdom from all sources during 1913 comprised the following:—



relatively high and low points in order to cause the grind-stones to cut or grind by the action of the high points on tools presented. In the present instance, the object of subjecting the trued periphery of the stone to the hard, smooth roll *y* is to crush down all the high points to the level of the low and relatively soft points, and to obtain clear across the peripheral face of the stone a uniform or uniformly level development of the grit. In this way I obtain a grinding surface of uniform grit before transversely fluting or grooving the broken-down surface of the stone. In Fig. 4 this fluting or transverse ribbing of the stone is obtained by rotating the grind-stone, trued as shown in Fig. 3, in contact with a steel bush-roll *z* provided with alternating lengthwise-extending peripheral teeth and grooves. The teeth and groove are so formed that the ribs 2 of the grind-stone are left with their tops flat and characterized by the uniformly developed grit already described. The grooves 3 between

Bleached, dry, 20,621 tons; unbleached, dry, 374,684 tons; wet, 16,498 tons; total 411,803 tons.

The foregoing figures give an average weekly consumption of about 7,900 tons. The imports of dry unbleached (together with a small quantity of bleached) chemical wood pulp into the United Kingdom last year, from the unmentioned countries, were:—Russia 41,628 tons; Germany 400,972 tons; Austria-Hungary 1,761 tons; total 84,361 tons.

These sources of supply being cut off the British pa-

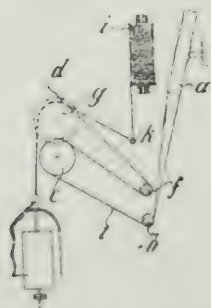
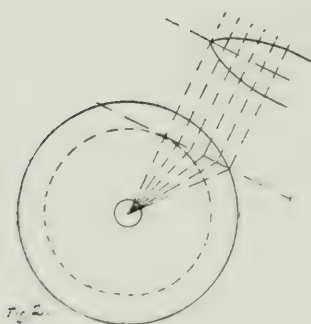
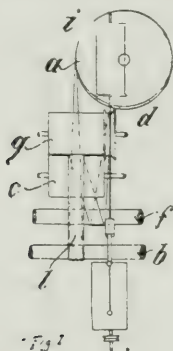
permaker has to face a weekly curtailment of some 1,600 tons. This of course will affect the imports into Manchester, which is one of the distributing centres for the supplies from Scandinavia and Canada.

Imports From Canada.

During the past few weeks, however, cargoes of wood pulp have been reaching this port rather freely, twelve steamers having arrived with an aggregate quantity of 106,000 bales, these figures including two shipments of about 40,000 bales of Canadian pulp from Chicoutimi.

DEVICE FOR SPINNING OF PAPER THREADS.

A recent German patent No. 272,903, by Mech. Seilerwaarenfabrik Akt.-Ges. in Alf a. Mosel, relates to a



the invention, the paper strip conducted by the conveying rollers is led directly to the spindle over a tension roll, and around a guide roll, provided with a circular groove and rigidly connected with the upper roll of the two conveying rolls in such manner that the rotation of the spindle is transmitted to the groove of the guide roll. According to the inventors, this device has the advantage of very simple construction, and it is claimed that it supplies a faultless thread.

In the drawing, a form of construction of the invention is shown, in which Fig. 1 is a front view, Fig. 2 shows a section on roll (g) with circular groove, and Fig. 3 is a lateral view.

The paper strip runs from spindle (a) over guide rod (b), through the conveying rolls (c) (d), from there back over a guide rod (f) and from there over the grooved disc (g) to spindle (h). If a textile thread is to be rolled into the paper thread, the former is carried from spool (i) through eye (k) to the grooved disc (g).

The flat paper strip (d), passing through the conveying rolls and over the guide by the grooved disc (g), the grooved roll acting as a funnel.

In Fig. 2 is shown the effective section of disc (g) and it may be seen in this figure in what manner the circular grooved roll operates as a funnel.

AMERICAN FORESTRY ASSOCIATION MEETS IN JANUARY.

In order to aid in outlining details of the important work it is to do next year, the American Forestry Association has invited leading Foresters throughout the country to attend its annual meeting in New York City on Monday, January 11th, at the assembly room of the Merchants' Association of New York in the Woolworth Building. The meeting is for the purpose of discussing the best service the Association can render to various phases of forestry, lumbering and the paper and pulp trade.

Chief Forester Henry S. Graves will speak of what the Association can do to aid the Forest Service, various state foresters will speak of what can be done in State Forestry, and other experts will discuss other forestry problems.

J. E. Rhodes, of Chicago, Secretary of the National Lumber Manufacturers' Association, has been invited to address the meeting on "What the Association can do to aid the lumbermen," and E. A. Sterling, of Philadelphia, the well known forest and timber engineer, will speak on "The Relation of the Public to a Sound Economic Basis in the Lumber Industry." E. T. Allen, forester of the Western Forestry and Conservation Association, of Portland, Oregon, and western representative of the American Forestry Association, will speak on "What the Association can do on the Pacific Slope," with special reference to the big public meeting which the Association plan to hold at the Panama-Pacific Exposition next July.

device for the spinning of paper threads, in which a paper strip, with the insertion of a textile thread, is rolled in on its two lateral edges. In accordance with

UNITED STATES NOTES

(Special to Pulp and Paper Magazine.)

The Wood End Container Corporation of Sanborn, N.Y., has given up its plant in that village and has consolidated with the Tonawanda Board and Paper Company at Tonawanda, N.Y. The machinery was moved from Sanborn on December 1.

* * *

The American Forest Products Corporation, of which Judge Vasco P. Abbott is president, was chartered during the past fortnight at Albany, N.Y., to deal especially in Canadian pulp wood, although its operations will not be confined to Canada. A. P. McKinnon is secretary and A. Bron Carter treasurer of the new company. John N. McDonald will be manager. The main office will be in Carthage.

* * *

Another incorporation of interest is that of the Southern States Pulp and Chemical Products Company of Philadelphia, Pa. The charter was filed last week in the State of Delaware with a capital stock of \$1,000,000. The new company will carry on the business of importers and exporters in paper and paper materials.

* * *

A despatch from Bangor, Me., says that according to Nathaniel M. Jones, now of St. John, N.B., where he is manager of the Edward Partington Pulp and Paper Company's various mills, pulp is still being imported from Germany, and the mills in that country are running and shipments are being regularly made, 1,000 tons having been received in New York last week. Mr. Jones was greatly surprised to learn of this fact in Boston, New York and other Eastern cities, where he had expected to get orders for pulp, resulting from an increased demand that it has been supposed would be created by the European war. The Partington Mills produce 120,000 pounds of bleached sulphite fibre per 24-hour day and there has as yet been no extra demand for the product.

* * *

The cutting of pulp wood in the north woods of the Adirondacks is booming at this time. Altogether there are now in the woods in that section over 200 wood-choppers and teamsters, and well over 24,000 cords have been cut.

* * *

The receivers of the Battle Island Paper Company held a conference on December 2 at 11 a.m. with Judge Ray in Norwich, Conn., for the purpose of examining and passing upon the report and account of the receivers, which report and account, inclusive of an unliquidated claim against the State of New York for \$1,800,000, and property and assets in Canada appraised at \$383,000 shows assets of the bankrupt concern aggregating \$2,460,215.88. The question of allowing the receivers, Gannon, Spencer and Mitchell, of Syracuse, \$7,000 was also discussed.

* * *

Two tons of sorghum bagasse, the waste product of the sorghum syrup industry, were tested in a commercial way in a straw board mill at Coffeyville, Kan. The test was successful and manufacturers pronounced the board suitable for certain classes of commercial work.

Construction of the big addition to the plant of the Kalamazoo Vegetable Parchment Company at Kalamazoo, Mich., was begun on December 1. The new building will be of the same size of the present plant, giving the company just twice the room for its business that it now has.

* * *

The Tissue Division of the American Paper and Pulp Association, held a meeting recently at Albany, N.Y., and H. H. Bishop was chosen secretary. The division made an interesting change in its plan of organization. Under the new plan there will be six subdivisions. The idea in this plan is to bring the members of the various sub-divisions into separate conference. These sub-division are as follows: Toilet, towels and napkins, high grades, white and colored, Manila and No. 2 white, waxing tissues, paper stock tissues. Under the head of "Paper stock tissues" only manufacturers of tissue from old papers are included.

* * *

Complaint against the advance in rates on wood pulps, etc., made by the Ann Arbor and other Eastern railroads in Eastern territory, effective November 16, was filed with the Interstate Commerce Commission at Washington by the Pulp and Paper Manufacturers' Association on December 1. From the nature of the complaint it is understood that the advance complained of is in consequence of the general advance in freight rates permitted by the Commission in Central French Association territory in the so-called advance rate decision handed down last July.

PAPER SHOES FOR MEN IN THE FIELD.

At a recent session of the war committee of the German Papermakers' Association consideration was given to the feasibility of manufacturing foot coverings for the men in the field from toughened paper. During the Russo-Japanese war, the Japanese troops were supplied with foot coverings and other articles of clothing made from paper, which, during the winter campaign, afforded excellent protection against cold and wet. The paper used for these articles, made from the fibres of plants grown for the purpose by means of the Japanese method of papermaking, was almost untearable and apparently waterproof. The footwear was stitched with thread in the same way as fabrics, being formed into short socks having soles and gaiter flaps. Similar articles of paper underclothing protected other parts of the body.

The paper was of a light yellow color, cross-ribbed in both directions on each side.—Paper, Inc.

Harold Richard Dunn, who for the past two years has been on the city selling staff of the Victoria Paper and Twine Co., Toronto, has enlisted with the second Canadian contingent and is now quartered at the Exhibition Grounds, Toronto, with the Twentieth Battalion as color-sergeant. Mr. Dunn had several years' military training in the Old Country and saw service during the campaign in South Africa.

Conditions in Norway and Denmark

Report of Mr. C. E. Sontum, Commercial Agent, Dept. of Trade and Commerce.

The Paper and Pulp Market.

Christiania, Norway, November 3, 1914.

The Norwegian trade paper "Tidsskrift for Papirindustri" in their issue of November 1 writes as follows:

Prices for news in rolls have been very irregular and changing almost daily. As mentioned before, one contract was closed at 220 kroner (\$58.06) per ton (metric), probably owing to the panic in England at the beginning of the war. It is expected, however, that more regular prices will be quoted in the future.

The prices for grease-proof and glittd grease-proof are still showing a tendency to rise and the demand is good. Other kinds of paper on the other hand, such as tissue, M.G. cap and newspaper of light weight are very little in demand. The markets for these varieties have been China and other over-sea countries. The supplies, therefore, have now to be stocked and the machines for making these kinds of paper are out of work and some of the mills have had to let their workmen go.

It is impossible to determine prices for the near future, as they are changing every week. It is reasonable to expect, however, that inquiries will soon be received. The German, French and Belgian markets are closed for export, and their customers will have to get their supplies from other countries.

Market for Cellulose.

The cellulose market is at present very quiet. The reason is that Swedish manufacturers have been clearing out their stock and it is noted that the import to Great Britain from Sweden during the last few weeks amounted to 25,000 tons (English) a week, while Norway has only shipped about 5,000 tons.

It has now been confirmed that the stocks at the cellulose mills in Norway are very small, being very much smaller than at this time last year, for sulphite as well as for sulphate. On account of the large sales for prompt delivery which have been made during the war, the unsold quantity for delivery during the present year is also very small; the statistical position, therefore, is very favorable for the sellers.

Prices are firm, being quoted as follows:—Sulphite, bleached, per ton (English) about \$61.33; sulphite, easy bleaching, about \$46.67; sulphite, strong, about \$42.67 to \$44.00, sulphate, cellulose, about \$42.67. These prices are f.o.b. Norwegian shipping port and net cash against documents.

Wood Pulp.

The pulp market also is very quiet at present in spite of some inquiries. There should be a rise in prices as the scarcity of the water supply is making itself very much felt and more so every day.

The Norwegian trade paper "Farnand" in its issue of November 24 thus reviews the situation:—

Those who expected a great boom in the paper trade as a consequence of the war have been sadly disappointed. In the first days of panic, it is true, fabulous prices were asked, and in isolated cases they were also paid. But the market soon lost its anxiety and its future supplies and the tone has become more and more quiet, with a gradual slowing down of business.

The demand for moist mechanical wood pulp has temporarily disappeared almost completely, chiefly as

a result of the large importation into the United Kingdom on the reopening of shipping and of the continued interruption of shipments to France and Belgium. Reports published in the daily papers with respect to the water scarcity are by no means encouraging. In large districts of Norway the farmers will have to cart water over long distances for the cattle and conditions are just as bad in Sweden. The output of mechanical pulp during the winter will therefore be greatly restricted, unless heavy rains are soon experienced. The opinion, therefore, may still be expressed that prices will be adjusted on a higher level than before the war.

Dry mechanical pulp is, on the other hand, in good demand at advancing figures. This is, however, of comparatively little interest to Norwegian makers who produce only small quantities of dry pulp.

Cellulose is firm, but very quiet.

The managing director of one of the mills of a leading paper pulp company, informed a newspaper representative that one of their paper mills will be run on short time, and that from next week it will only be run four days a week, the reason being shortage of orders. This will affect some 200 workpeople who will get fewer shifts. Some newspapers had predicted a boom in paper and cellulose during the war, but the reverse has happened. The demand is much below the normal, and prospects are far from good. At the outbreak of hostilities there was a spurt, but since then the buying power has steadily decreased as the consumption is considerably less than before, probably because newspapers appear with fewer pages and the printing of books has almost ceased.

Effect of Water Shortage on Logging.

The continual drought, which has prevailed during the summer throughout Norway and which is still continuing, has caused considerable delay in the floating of lumber on most of the Norwegian rivers, while on several of the smaller rivers the floating has been practically a failure.

When the large quantity, which has been brought down to the Glommen river, the largest river in Norway, is taken into account, the situation in that district is not so bad. On most of the smaller rivers, however, there are large quantities of logs, which cannot be brought any further. This lumber will remain in the rivers over winter, and the frost and the moisture will likely damage it to a great extent. It is calculated that about 400,000 logs are thus lying in the rivers. As frost and snow may now set in at any time, there is only a small chance of getting this lumber down to the mills before the spring.

Swedish Paper and Pulp Market.

Reports received from Sweden indicates that the paper market shows signs of improvement, as Swedish paper is finding its way to South America and India. The Swedish paper industry at the opening of the war became very quiet simultaneously with the decrease of sales in the home market. The first weeks of the panic having passed the market has now settled down and the inquiries from abroad are increasing. This has special reference to news paper in the markets previously exploited by the German paper manufacturers. From Greece and Turkey inquiries for deliveries have been received with offers to pay cash in advance, which has not previously been the custom. There are even inquiries from Egypt and an Egyptian business man recently visited Sweden for this purpose. South American states, e.g., Bolivia, are experiencing a lack of paper and are trying to buy in Sweden. In-

dia, which up to the present bought most of her paper from Germany, is also inquiring for Swedish paper. The prices are good although lower than was hoped, and sales of news have taken place at kr 165.00 (\$44) per ton (English) f.o.b. the west coast of Sweden.

Inquiries for other kinds of paper are also increasing and prices are better, although the rise in prices does not keep pace with the increased cost of production. It has been possible however to demand stricter terms of payment.

As far as the export of pulp is concerned the increase is less marked, especially with reference to shipments to England. This, together with the shortage of water, has considerably decreased the production.

The cellulose market is unchanged and the prices are firm, but the mills hope during the winter to obtain higher prices as Finland, which is one of their severest competitors, has ceased to export.

Imitation parchment is in great demand and high prices are received. Kraft paper is also saleable at a higher price.

Shortage of Sulphur in Sweden.

According to the "Svensk Export" the prospects for the Swedish sulphite mills are not bright, since it is very difficult for them to obtain sulphur for producing their boiling acid. From Italy the export of sulphur is prohibited and from America, where supplies could be obtained, it is difficult to get the regular steamers to carry it. Very little sulphur is in the hands of speculators, and they therefore do not sell, unless a very high price can be obtained. The mills are now, however, making energetic efforts to get in a sufficient supply.

Swedish Pulp Prices.

The latest Swedish pulp prices quoted are as follows:			
Mechanical moist white	\$10.67	to	\$12.00
Do., dry white	22.67	to	24.00
Sulphite, prime, easy bleached	44.00		
Do., strong	40.00	to	41.33
Sulphate, easy bleached, ordinary	40.00	to	41.33
Do., strong	40.00	to	41.33
All per English ton, f.o.b. Swedish ports.			

NEW PROCESS FOR SAVING SULPHITE.

Mr. George C. Sherman, whose name has been connected with investigations on the slower running of paper machines in order to make greater profits, is now undertaking with Mr. Hall, a director of the Taggart Paper Company, and Fred. H. Clark, of New York, the formation of a company to be known as the Hall Process Corporation, incorporated under the laws of the State of New York, and has already begun business with offices in the Sherman Block in this city. The company has a capital of \$100,000.

The company, according to Mr. Sherman, "is organized primarily to introduce a new process and apparatus for making chemical pulp invented by Mr. Hall, and for which a patent is pending. Although the apparatus has not been fully installed, nevertheless the new process has been in partial operation at the mills of the Taggart Paper Company at Felts Mills and Great Bend for six weeks past with complete success. The inventor claims that he will be able to produce standard newsprint from ground wood alone, without the use of any sulphite.

"Mr. Hall is not ready to disclose all the details of his invention at present, but is willing to state that a very large increase in production will be secured for a given power. Moreover, the quality is greatly im-

proved, the fibres produced being strong, silky and uniform. Ground wood is always much cleaner than sulphite, and a better sheet of paper with respect to cleanliness is produced as the percentage of sulphite is reduced. Besides this, sulphite is gummy and sticks to the rolls of the machine, causing many breaks and a consequent loss in production. Further, sulphite and ground wood do not require the same amount of heat to evaporate the water from them, and fibre from sulphite contract differently from ground wood, causing paper often to curl on the edges, making trouble on the press. But perhaps the most important result of Mr. Hall's process is that it makes ground wood fibres as uniform in length, thickness and strength as sulphite. This uniformity makes it possible to form a sheet of sufficient strength for commercial requirements solely from ground wood, and therein, of course, lies its practical value.

"It is impossible to make ground wood with any degree of fibre uniformity under the old process. The stone is sharpened by the use of a jig, and grinds until it is dull or glazed over, when it is sharpened again. The quality of the product is constantly changing, and in actual practice is never uniform. Mr. Hall has invented an apparatus which diminishes the power required, and at the same time preserves practical uniformity of product. Under the old process of making newsprint paper, long sulphite fibres are mixed with the necessarily diversified ground wood fibres. These diversified fibres are reinforced by the sulphite fibres to provide requisite tensile strength for the sheet of paper.

"The company will also render services in connection with giving expert engineering and cost accounting advice, but this feature of its business will only be advisory and incidental to its main purposes, and it will not enter the field already occupied by engineers and accountants."

Mr. Hall, the inventor of the new process, who has been for several years the general superintendent of the St. Regis Paper Company's mills, left the employment of that company last week. Although he will retain his residence in Carthage, he will have an office with the Taggart Paper Company suite in the Sherman building here. He is considered one of the best-versed men in the State on the subject of the grinding of pulp and paper-making.

HARD PAPER DRINKING TANKARDS.

Owing to the requirements of the troops passing through that city, a Dusseldorf manufacturer has presented to the National Women's Association 10,000 hard paper drinking tankards, made on his special machines. They are cylindrical in shape and of wound gray paper, 3 1/4 inches in diameter and 4 inches high, internally coated with paraffin. These tankards are produced so cheaply that hot or cold beverages can be supplied to soldiers on the trains, to be consumed while travelling, the receptacles being then thrown away to save rinsing. This fact alone has so far rendered them specially applicable to the Dusseldorf Red Cross Hospital.

The machine winds five layers of paper containing a large proportion of ground wood, bending them into a solid body and fastening on the cap. By the machine in question 15 to 30 tankards a minute can be produced. The base of the tankard can be put on by hand, by which means the paraffin can be applied. The vessels can also be used as pasteboard boxes for keeping small articles.—Paper Trade Journal.

PULP AND PAPER NEWS

W. J. Gage, head of W. J. Gage and Company, Toronto and Kinleith Paper Mills of St. Catharines, has been elected president of the Toronto branch of the Victorian Order of Nurses succeeding the late Col. D. R. Wilkie.

The Riordon Pulp and Paper Company of Montreal, who have plants at Merriton and Hawkesbury, Ontario and turn out fifty thousand tons of sulphite pulp annually, have declared their regular quarterly dividend of one and three quarters per cent on the preferred stock of the company.

The total revenue of the province of Ontario for the fiscal year, just ended, including moneys borrowed within the twelvemonth, is \$19,577,414 and the total expenditure, capital and ordinary, about \$20,000,000. The biggest drop in the estimates was about half a million dollars in Crown Lands, the chief decline being in the revenue from timber.

H. R. Pousette, Canadian Trade Commissioner, Buenos Aires, Argentina, has written to several paper manufacturing firms pointing out the opportunities which exist for doing business in that republic. He says that, owing to the elimination for the present of competition from Germany, France, Belgium and Austria and the strong possibility of its being much weakened for a long time in the future, Canadian paper manufacturers have a most unique opportunity to gain a solid foothold in the markets of Latin America. Argentina has for some time been passing through a financial crisis but eventually she will emerge from it stronger and much wiser for the experience and better able to take advantage of her boundless resources. The Republic will be the first in South America to recover from the present situation and, therefore, should receive the earliest consideration. Mr. Pousette asks for the fullest negotiations and that firms send him information with regard to samples, prices, etc.

Many friends in the paper and publishing trade learned with regret last week of the death of Chester B. Ames, former secretary of the Printers Board of Trade, Toronto, and later manager of the Art Publishing Company, Toronto, who was found dead in a state room on a Mississippi steamer near Memphis. Taken with a bullet wound in his heart. Mr. Ames had left Toronto only a few days before and worry over business since the outbreak of the war is believed to have driven him temporarily insane. William Robert Orr, a former resident of Toronto, who has been associated with the newspaper business since 1891 and was President and General Manager of the Detroit "Saturday Night" also died last week. His father was for many years city auditor of Toronto.

At a banquet tendered Hon. W. H. Hearst, Premier of Ontario, by his many old friends and admirers in South St. Marie, Ont. at which over four hundred guests were present, the Premier announced that a vigorous policy of development of Northern Ontario would be presented and referred to the legislation which will be passed at the forthcoming session of the Ontario leg-

islature permitting of the export of pulp wood where the timber has fallen or is going to waste, but reiterated that Canadian mills would be amply safeguarded in the matter. He thought that allowing the cutting and export of pulp wood by the settlers would in a large measure relieve unemployment.

The new combination pasting machine, which was recently installed in the plant of Hinde and Dauch Paper Company of Canada in Toronto, for the making of wall board, fibre board and fibre boxes is now in operation. The machine is 100 feet long and 80 inches wide and has a capacity of twenty tons per day. In the production of the new lines jute, chip and filled board are used. The fibre boxes and containers are non-puncturing and waterproof and are being used largely for shipping purposes.

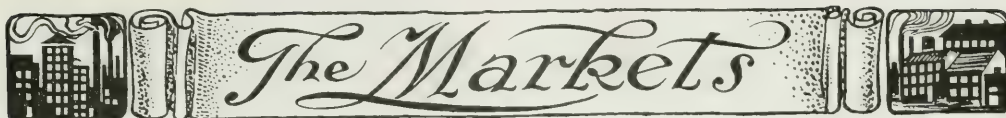
An order has been granted winding up the Owen Sound Lumber Company which was incorporated in 1910 with a nominal capital stock which was afterwards increased to \$200,000. A statement issued a few months ago showed that the company had a deficit of \$20,000.

Hon. Robert Jaffray, of Toronto, who is president of the Globe Printing Company, has been appointed president of the Imperial Bank of Canada succeeding the late D. R. Wilkie. Mr. Jaffray is eighty years of age but is very vigorous. The Imperial Bank is some times looked upon by the trade as the bank of the paper and pulp makers, in this respect, that a number of paper manufacturers in this line are shareholders and numerous paper firms carry their accounts in the institution.

Next month F. M. Ellis, who is in charge of the big envelope factory of Barber-Ellis, Limited, at Brantford, will remove to Toronto to take full charge of the buying and selling end of Barber-Ellis, Limited, relieving his father, J. F. Ellis, who, for over forty years has been identified with the paper trade and being in his 70th year, is desirous of being relieved of a portion of the heavy responsibility which he has borne as Manager and Treasurer of the company for such a long period. Charles G. Ellis, another son of J. F. Ellis, will become manager of the factory at Brantford, which, during the past year, turned out over three hundred million envelopes.

Some improvements have been made to the plant of the Dryden Timber and Power Co., Dryden, Ont. The smelter has been rebuilt as well as both sides of the recovery room. About one thousand tons per month of pure kraft fibre pulp are being turned out and a large proportion has been contracted for during the coming year. The company are now making a kraft sheathing paper, which is largely used by builders and for which the Standard Paper Co., George Street, Toronto, have been appointed selling agents.

Ritchie and Ramsay, Limited, Toronto, have just placed on the market a new brand of paper which will be known as "Kotelbond." It comes in sepia, white and azure and will take excellently half-tones and all fine art work. The firm report that during the past month their plant has been busier than any month since the outbreak of the war.



The Markets

CANADIAN MARKETS

The news print mills continue busy and prices are firm. The outlook is not much changed from the last report, and the demand is good. Many contracts will be renewed within the next few weeks and some manufacturers think that the prevailing quotation will be about a dollar a ton higher than it was during the past year. Book and writing mills are not rushed but report that business seems to be picking up a little, although still spotty. The falling off in output since the war has been estimated from 10 to 20 per cent, but a number of firms, which have held back catalogues, are now taking fresh courage and going ahead with their undertakings in the printing line. Several printing houses in Toronto are figuring on large contracts after the first of the year. Business establishments are now getting used to the war and are talking more about business and less about the unpleasantness in Europe.

Wrapping papers are quiet in all lines. There is never much life to the trade during December and this year is no exception. No improvement is looked for until after the holidays. In the meantime many mills and warehouses are improving the time during the present month by taking stock. Others are conducting experiments on new lines and experts have arrived from foreign countries to try producing glassine, greaseproof, parchments and other ranges of paper. While some of these experiments have been fairly successful, they have not yet reached a stage where anything definite can be given out. Coated paper mills report that business is good to what it has been. The demand for ground wood pulp continues fair and prices remain about the same. Water conditions have improved with several mills.

Sulphite pulp shows a tendency to decline and as a result it is not thought that book and writing plants, whose contracts expire at the end of 1914 for sulphite will raise prices. Whatever increase there is in sulphite they will pocket the loss and continue to do business at the old figure—at least, for a while, as one of the largest producers remarked this week that, in his opinion, it would be unwise to elevate prices with the market for fine papers in the rather quiet condition that it is. During the past few weeks one leading firm received an order for about one hundred and fifty tons of art photo-paper, which is being used by a large catalogue house for printing half-tones in the place of coated stock, besides being considerably lighter and saving much in postage. Manufacturers of Canadian writing papers have placed some patriotic papetries on the market since the war which have had a big demand and other fancy lines of decorative paper, which formerly came from Germany, are being produced in the Dominion. A canvass made of the wholesale stationers and jobbing houses in Toronto during the past week elicits the information that business is very good, all things being considered, although orders from the West have fallen off considerably.

All business firms are being urged to use Made-in-Canada papers and statistics show that there has been about six million dollars' worth of foreign paper which

Canadians have been buying every year in preference to Canadian paper. The average price paid for this paper would run about twelve cents, and it, therefore, means that about fifty thousand tons have been imported, which a competent authority states would represent the annual product of seventeen mills employing about three thousand workmen, each supporting a family. He points out that quality for quality and price for price, the Canadian papers—except a very few brands which are not yet made in the Dominion—are superior to imported. Canadian business firms have not taken the trouble to ask for papers made in the Dominion. In fact, some influential houses which have recently sent out holiday literature talking up Made-in-Canada products, have had their printing done on German coated and other imported stock, and it is reported that one Canadian bank recently placed an order for several thousand dollars in calendars with a concern across the border. It would perhaps do many firms a world of good to practice a little more consistency.

In the rag and paper stock, business is quiet, and it is not expected that any material change in prices will take place until after the new year. Some lines are, however, holding their own but in the big centres things are slackening off and mills are purchasing cautiously and in limited quantities.

Quotations, L.o.b. Toronto, are:—

Paper.

News (rolls), \$1.95 to \$2.05 at mill, in earload lots.
 News sheets, \$2.10 to \$2.15 at mill, in earload lots.
 News (sheet), \$2.20 to \$2.75, depending on quantity.
 Book papers (earload), No. 3, 3.75c. to 4.25c.
 Book papers (ton lots), No. 3, 4c. to 5.50c.
 Book papers (earload), No. 2, 4.25c.
 Book papers (ton lots), No. 2, 4.50c. to 5.25c.
 Book papers (earload) No. 1, \$4.75 to \$5.25.
 Book papers (ton lots), No. 1, 5.25c. to 6.00c.
 Writings, 4½¢ up.
 Sulphite bond, 6½¢. to 7½¢.
 Grey Browns, \$2.35 to \$2.75.
 Fibre, \$3.35 to \$4.00.
 Manila, B., \$2.85 to \$3.25.
 Manila, No. 2, \$3.10 to \$3.50.
 Manila, No. 1, \$3.35 to \$4.00.
 Unglazed Kraft, \$3.90 to \$4.50.
 Glazed Kraft, \$4.75.

Pulp.

Ground wood pulp at mill, \$16.00 to \$18.00.
 Ground wood, \$22 to \$25 delivered.
 Sulphite (unbleached), \$45 to \$46, del. in Canada.
 Sulphite (unbleached), \$46 to \$47, delivered in U.S.
 Sulphite (bleached) \$58 to \$60.
 Sulphite (bleached), \$59 up, delivered in U.S.

Paper Stock.

No. 1 hard shavings, \$2.00 to \$2.05, Toronto.
 No. 1 soft white shavings, \$1.85.
 No. 1 mixed shavings, 55¢.
 White blanks, \$1.00.
 Heavy ledger stock, \$1.50.

Ordinary ledger stock, \$1.15.
 No. 2 book stock, 50c.
 No. 1 book stock, 90c.
 No. 1 Manila envelope cuttings, \$1.20.
 No. 1 print Manilas, 60c.
 Folded news, 45c.
 Over issues, 50c.
 No. 1 clean mixed paper, 25c to 30c.
 Old white cotton, \$2.50 to \$2.75.
 No. 1 white shirt cuttings, \$5.75 to \$6.00.
 Black overall cuttings, \$1.75.
 Thirds, blues, \$1.50.
 Black linings, \$1.75.
 New light flannelettes, \$5.00.
 Ordinary satinet, \$1.00.
 Flock, \$1.10.
 Tailor rags, 90c.
 Manila rope, 2 $\frac{3}{4}$ to 3.
 No. 1 burlap bagging, 95c.

Quotations f.o.b. Montreal are:—

Book—News—Writing and Posters.

Roll News, \$40 to \$43 per ton for large orders; \$45 to \$50 per ton for small orders.
 Ream News, \$45 to \$47 per ton for large orders; \$50 to \$60 per ton for small orders.
 No. 1 Book, 5 $\frac{1}{4}$ c to 6c per lb.
 No. 2 Book, S.C., \$4.50 to \$4.75 in large quantities; \$4.75 to \$5.50 in small quantities.
 No. 3 Book, M.F., \$4.00 to \$4.25 in large quantities; \$4.40 to \$4.50 in small quantities.
 Writings, 5c to 7 $\frac{1}{2}$ c.
 Sulphite Bond, 6 $\frac{1}{2}$ c to 8 $\frac{1}{2}$ c.
 Writing Manila 5c.
 Colored Posters 4c. to 5c. per lb.
 Cover Paper 5 $\frac{1}{2}$ c. to 7c.

Wrappings.

Gray Brown, per 100 lbs., car lots, \$2.25 net; 5 tons \$2.45; 2 tons, \$2.55; 1 ton, \$2.65; less, \$2.75.
 Red Brown, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, 3.15; less, \$3.25.
 B. Manila, car lots, \$2.85; 5 tons, \$2.95; 2 tons, \$3.05; 1 ton, \$3.15; less, \$3.25.
 No. 2 Manila, car lots, \$3.10; 5 tons, \$3.20; 2 tons \$3.30; 1 ton, \$3.40; less, \$3.50.
 No. 1 Manila, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton, \$3.65; less \$3.75.
 Kraft, \$3.75 to \$5.00.
 Fibre, car lots, \$3.25; 5 tons, \$3.45; 2 tons, \$3.55; 1 ton \$3.65; less \$3.75.
 Fibre, \$2.75 to \$3.50.
 Manila, B., \$2.50 to \$3.25.

On large orders to the jobbing trade some manufacturers are quoting 10 per cent off the above prices on wrapping.

Pulp.

Sulphite easy bleaching, \$43 to \$45 per ton.
 News quality, \$41 to \$42 per ton.
 Attached sulphite, \$54 to \$59 per ton.
 Offset pulp, \$3.60 to \$4.00.
 Ground wood No. 2, \$22 to \$24, delivered United States.
 Ground wood No. 1, \$15 to \$16.

NEW YORK MARKETS

(Special to Pulp and Paper Magazine.)

New York, N.Y., December 12, 1914.

During the interval there has been little change in the ground wood situation. Supplies for immediate delivery are rather scarce as most manufacturers have contracted for their entire output until the first of the year or later. Some mills are well sold up for a large part of their product for the coming year. There is a fairly large quantity of pulp being delivered to certain paper mills in this country at a mill price considerably below the present market value. It is said that it is now impossible to obtain any appreciable supply of ground wood for less than \$17.50 at the pulp mill for January delivery. That the value is held firmly by all grinders is not questioned by paper makers.

There has been a little more activity in the sulphite market, but the price tone is still somewhat weaker than a month ago. Prices of all grades of foreign cellulose have reflected an easier tone. It was reported that a Scandinavian mill offered 2,500 tons of strong unbleached c.i.f. American ports, 1.90c, for immediate shipment. The offer did not receive anything but indifferent replies from purchasers. It was said that the offer was probably made to clear the sulphite mills of all supplies on hand before the close of navigation. Bleached sulphite is rather quiet, and is quoted at 2.85c to 3c, ex dock. Easy bleaching is fairly firm at 2.20c to 2.30c ex-dock. Kraft is rather quiet and is weak for spot delivery and strong for contract shipment.

Both domestic and foreign rags have been inactive during the interval. The market has been featureless and weak. Linens can be obtained at lower prices than six weeks ago, despite the embargo on all grades of paper stock from Germany. There seems to be a fair storage supply available in New York at present. Roofing rags are dull and weak.

Bagging and rope are quiet and weak. Export business in waste twines and cordage is quiet as most consuming countries are involved in the European war.

Old waste papers were reported to be weaker and quieter than at any time this year. There is some keen competition among the packers of shavings on contracts with large printers and binderies for supplies covering 1915. Binders are asking higher prices for shavings than last year and packers cannot afford to pay the advances asked. Old Manilas and krafts are in quiet demand and weak in price. Book stock is moving better than any other grade but values are lower than a month ago. Mixed papers are moving at about the costs of packing and shipping.

Pulp.

Ground Wood, No. 1, \$20 to \$25.50, delivered.
 Ground Wood, No. 2, \$17.50 to \$20, delivered.
 Unbleached Sulphite, dom., 2 $\frac{1}{4}$ to 2 $\frac{1}{2}$, delivered.
 Unbleached Sulphite, imptd., 1.95c to 2.10c, ex dock New York.
 Bleached Sulphite, domestic, 3.35c, delivered.
 Bleached sulphite, impt., 2.85c to 3.05c, ex dock, New York.
 Easy Bleaching, impt., 2.20c to 2.30c ex dock, N.Y.
 Unbleached sulphite, impt., 2.00c to 2.15c ex dock, N.Y.
 Bleached sulphite, impt., 2.80c to 3.00c, ex dock, N.Y.
 Kraft Pulp, 2.00c to 2.15c ex dock, New York.

Paper.

There has been spotty buying in paper during the interval. Jobbers report in some cases a slight improvement to business in all grades. Mills anticipate a dull tone to business until well into next month after stock-taking and the closing of accounts for the year. With the opening of the stock exchanges in New York, there was a revival of optimism and the effect has been encouraging so far as talk in the trade is concerned. Collections were reported to be a little freer than for some time. A steady demand and normal contract consumption is the description of the newsprint situation. Contract renewals for the coming year have been rather slow in maturing. Prices for the coming year, it is thought by some may average about \$2.00 a ton higher than last year, owing to the higher costs of ground wood pulp. Sheet news remained steady at 2.30, New York. Side runs moved fairly well at current values. Wrapping papers reflected a quiet tone and were in poor demand. It was reported that prices on wood Manilas were rather weak. Other grades remained firm in value. Some manufacturers of bag paper were unable to deliver on contracts as they were without sufficient supplies of ground wood to make the paper. Book papers showed an improvement with the season publication business now on in full swing. Prices are firm, but unsatisfactory so far as profits are concerned. The mills which advanced prices in the west were forced to reduce them again on account of the falling off in demand. There has been a poor demand for boards of all grades and a number of mills have shut down. Prices remain unchanged. The tissue market was reported weaker and featureless as

far as the movement of any appreciable tonnage was concerned. Writings, bonds and ledgers moved quietly and with little snap. Prices were essentially unchanged. Cover papers and specialties were without much snap. Some colors are scarce and values are higher. Paper bag manufacturers have been curbing production on account of a poor demand. There are low stocks of bags in the hands of jobbers and it is believed that the turn of the year will bring a good demand and firm prices.

Quotations unchanged for all grades of paper:—

News, rolls, transient business, \$1.95 to \$2.05 f.o.b.
 News, rolls, contract renewals, \$2.05, f.o.b.
 News, side runs, 2.25, f.o.b. New York.
 News, sheets, 2.30, f.o.b. New York.
 News, sheets, 2.35, f.o.b. New York.
 Book papers, car lots, M.F.S., \$3.75 to \$3.90 f.o.b.
 Writing paper, supertine, 13³/₄c to 17c, del. east of Miss. River.
 Writing paper, extra fine, 11c del. east Miss. R.
 Writing paper, No. 1, fine, 9c, del. east Miss. River.
 Writing paper, No. 2, fine, 8c del. east Miss. River.
 Writing paper, engine sized, 4¹/₂c to 8c, east Miss. R.
 Bond paper, 5c to 24c, delivered east of Miss. R.
 Ledger paper, 8c to 30c, delivered east of Miss. River.
 Linen paper, 7c to 18c, delivered east of Miss. River.
 Manila jute, 5¹/₂c to 5³/₄c, delivered.
 Manila, wood, 2.65c to 3.25c, delivered.
 Kraft, No. 1, \$3.75 to \$4.00 f.o.b. New York.
 Kraft, No. 2, \$3.35 to \$3.60 f.o.b. New York.
 Boxboards, news, \$27 per ton, delivered.
 Boxboards, straw, \$25 per ton, delivered.
 Wood pulp board, \$40 per ton, delivered.
 Tissue, white, cylinder, 47¹/₂ to 50c f.o.b. New York.
 Tissue, fourdrinier, 50c f.o.b. New York

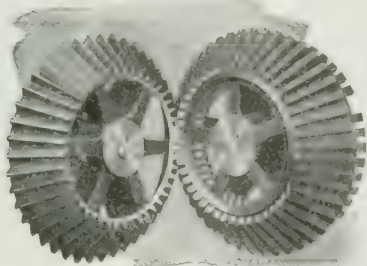
MATERIAL FOR LARGE PAPER SACKS AND OTHER PURPOSES.

One of the most active branches of European paper manufacture is now the production of large woven or other sacks from paper. The few mills which make paper sacking in Germany and Austria are engaged day and night on paper intended to replace the jute sacking. The factories making large bag machines are fully occupied as well as those making strengthened paper by the insertion of a wire or woven tissue between two layers of paper, or by conducting the same into one web by pasting. These papers, such as papyrolin, thread paper, etc.) serve for the manufacture of specially durable large paper sacks.

Crepe papers of soft tough fibre are specially adapted to the production of articles such as socks, vests, etc., the demand for the army being exceptionally large and stocks of wool and cotton goods being very low.

German cigarette manufactures have been in the habit of using French papers, although German and Austrian qualities are equally as good. Manufacturers in the two last named countries are thus working to their full capacity. During the Russo-Japanese war, the Japanese troops wore socks and other garments of paper. The article was untearable and water-tight, being of a light yellow pulp color, and was made by a special Japanese process.—Paper Trade Journal.

ERRATUM On Page 709 this issue 1st col. 21st line, for "19 deg. F." read "175 deg. F."



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VOL. XII.

YEAR 1914



SCHOOL OF FORESTRY

JUN 21 1915

UNIVERSITY OF TORONTO



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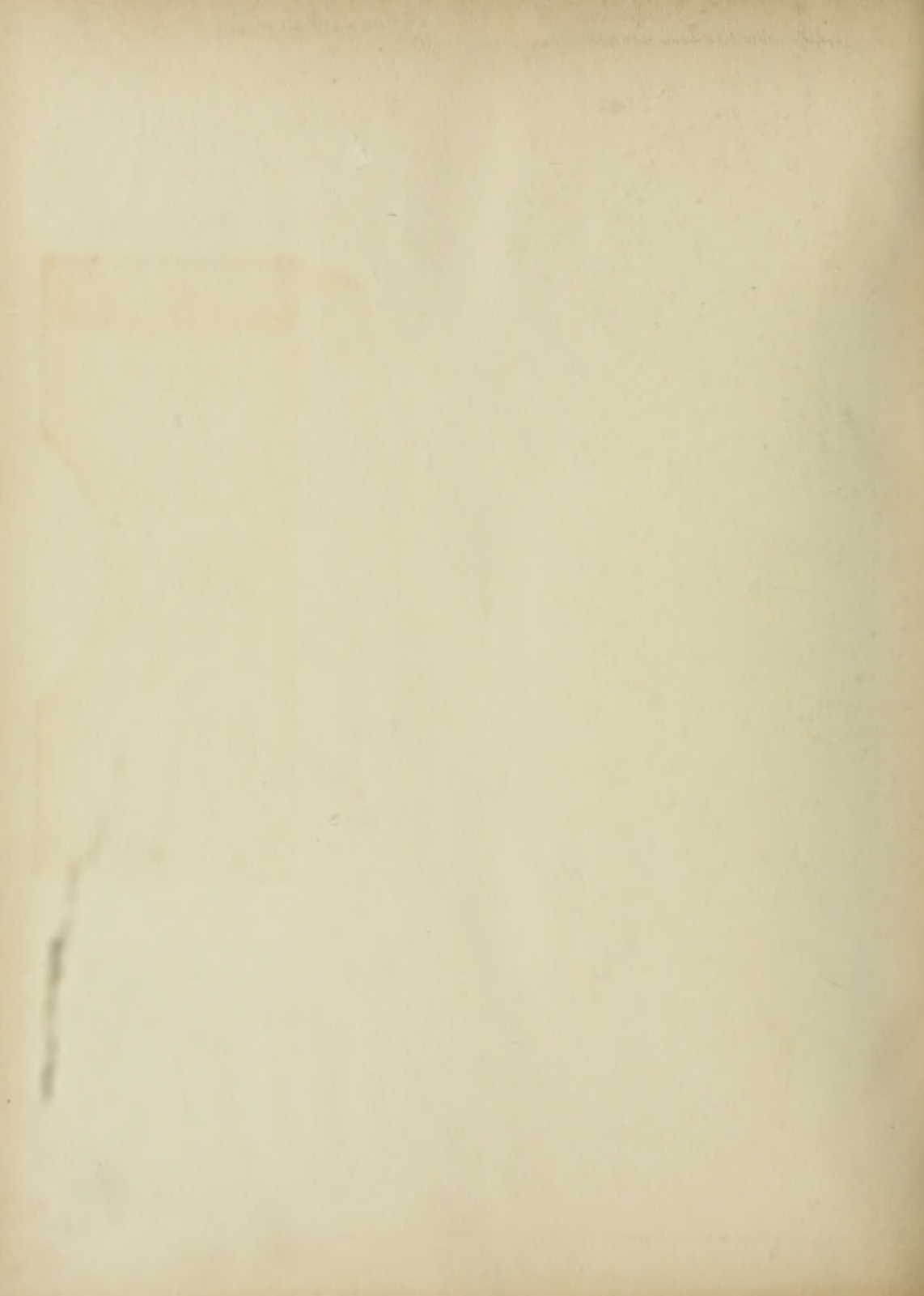
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